SBML Model Report

Model name:
"Levchenko2000_MAPK_Scaffold"

SBML2LATEX

May 6, 2016

1 General Overview

This is a document in SBML Level 2 Version 1 format. This model was created by Bruce Shapiro[1] at February 25th 2005 at 11:43 p.m. and last time modified at June third 2014 at 2:35 p.m. Table 1 shows an overview of the quantities of all components of this model.

Table 1: Number of components in this model, which are described in the following sections.

Element	Quantity	Element	Quantity
compartment types	0	compartments	1
species types	0	species	86
events	0	constraints	0
reactions	300	function definitions	0
global parameters	0	unit definitions	0
rules	0	initial assignments	0

Model Notes

MAPK cascade on a scaffold

Citation

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[1]NASA Jet Propulsion Laboratory, bshapiro@jpl.nasa.gov

Levchenko, A., Bruck, J., Sternberg, P.W. (2000).Scaffold proteins may biphasically affect the levels of mitogen-activated protein kinase signaling and reduce its threshold properties. Proc. Natl. Acad. Sci. USA 97(11):5818-5823.http://www.pnas.org/cgi/content/abstract/97/11/5818

Description

This model describes a basic 3-stage Mitogen Activated Protein Kinase (MAPK). Kinases in solution are written as K[3,J], K[2,J], K[1,J] for MAPKKK, MAPKK, and MAPK, respectively, J indicates the phosphorylation level, J=0,1 for K3 and J=0,1,2 for K2 and K1. Scaffolds have three slots, for MAPK, MAPKK, and MAPKKK, respectively. Bound and free scaffold are denoted as S[i,j,k], where i, j, and k indicate the binding of K[1,i], K[2,j] and K[3,k] in their respective slots. Here i,j=-1,0,1,or,2 and k=-1,0,or,1. A value of -1 means the slot is empty, 0 means the unphorphorylated kinase is bound, 1 means the singly phosphorylated kinase is bound, and 2 means the doubly phosphorylated kinase is bound. Thus S[1,-1,2] is a scaffold with K[3,1] bound in the first slot and K[1,2] in the third slot, while the second slot is empty.Note: Indices X[I,J,K] are translated into the unindexed variable X_I_J_K and so forth in the SBML. Negative indices are translated as mI, etc, thus S[1,-1,2] becomes S_1_m1_2.

Rateconstant	Reaction
a10=5.	MAPKP+K[1,2]->K_MAPKP[1,2]
a1=1.	RAFK+K[3,0]->K_RAFK[3,0]
a2=0.5	RAFP+K[3,1]->K_RAFP[3,1]
a3=3.3	K[2,0]+K[3,1]->K_K[2,0,3,1]
a4=10.	MEKP+K[2,1]->K_MEKP[2,1]
a5=3.3	K[2,1]+K[3,1]->K_K[2,1,3,1]
a6=10.	MEKP+K[2,2]->K_MEKP[2,2]
a7=20.	K[1,0]+K[2,2]->K_K[1,0,2,2]
a8=5.	MAPKP+K[1,1]->K_MAPKP[1,1]
a9=20.	K[1,1]+K[2,2]->K_K[1,1,2,2]
d10=0.4	K_MAPKP[1,2]->MAPKP+K[1,2]
d1=0.4	K_RAFK[3,0]->RAFK+K[3,0]
d1a=0	S_RAFK[0,0,0]->RAFK+S[0,0,0]
d1a=0	S_RAFK[0,-1,0]->RAFK+S[0,-1,0]
d1a=0	S_RAFK[0,1,0]->RAFK+S[0,1,0]
d1a=0	S_RAFK[0,2,0]->RAFK+S[0,2,0]
d1a=0	S_RAFK[-1,0,0]->RAFK+S[-1,0,0]
d1a=0	S_RAFK[1,0,0]->RAFK+S[1,0,0]
d1a=0	S_RAFK[-1,-1,0]->RAFK+S[-1,-1,0]
d1a=0	S_RAFK[-1,1,0]->RAFK+S[-1,1,0]
d1a=0	S_RAFK[1,-1,0]->RAFK+S[1,-1,0]

d1a=0	S_RAFK[1,1,0]->RAFK+S[1,1,0]
d1a=0	S_RAFK[-1,2,0]->RAFK+S[-1,2,0]
d1a=0	S_RAFK[1,2,0]->RAFK+S[1,2,0]
d1a=0	S_RAFK[2,0,0]->RAFK+S[2,0,0]
d1a=0	S_RAFK[2,-1,0]->RAFK+S[2,-1,0]
d1a=0	S_RAFK[2,1,0]->RAFK+S[2,1,0]
d1a=0	S_RAFK[2,2,0]->RAFK+S[2,2,0]
d2=0.5	K_RAFP[3,1]->RAFP+K[3,1]
d3=0.42	K_K[2,0,3,1]->K[2,0]+K[3,1]
d4=0.8	K_MEKP[2,1]->MEKP+K[2,1]
d5=0.4	K_K[2,1,3,1]->K[2,1]+K[3,1]
d6=0.8	K_MEKP[2,2]->MEKP+K[2,2]
d7=0.6	K_K[1,0,2,2]->K[1,0]+K[2,2]
d8=0.4	K_MAPKP[1,1]->MAPKP+K[1,1]
d9=0.6	K_K[1,1,2,2]->K[1,1]+K[2,2]
k10=0.1	K_MAPKP[1,2]->MAPKP+K[1,1]
k1=0.1	K_RAFK[3,0]->RAFK+K[3,1]
k1=0.1	S_RAFK[0,0,0]->RAFK+S[0,0,1]
k1=0.1	S_RAFK[0,-1,0]->RAFK+S[0,-1,1]
k1=0.1	S_RAFK[0,1,0]->RAFK+S[0,1,1]
k1=0.1	S_RAFK[0,2,0]->RAFK+S[0,2,1]
k1=0.1	S_RAFK[-1,0,0]->RAFK+S[-1,0,1]
k1=0.1	S_RAFK[1,0,0]->RAFK+S[1,0,1]
k1=0.1	S_RAFK[-1,-1,0]->RAFK+S[-1,-1,1]
k1=0.1	S_RAFK[-1,1,0]->RAFK+S[-1,1,1]
k1=0.1	S_RAFK[1,-1,0]->RAFK+S[1,-1,1]
k1=0.1	S_RAFK[1,1,0]->RAFK+S[1,1,1]
k1=0.1	S_RAFK[-1,2,0]->RAFK+S[-1,2,1]
k1=0.1	S_RAFK[1,2,0]->RAFK+S[1,2,1]
k1=0.1	S_RAFK[2,0,0]->RAFK+S[2,0,1]
k1=0.1	S_RAFK[2,-1,0]->RAFK+S[2,-1,1]
k1=0.1	S_RAFK[2,1,0]->RAFK+S[2,1,1]
k1=0.1	S_RAFK[2,2,0]->RAFK+S[2,2,1]
k1a=100	RAFK+S[0,0,0]->S_RAFK[0,0,0]
k1a=100	RAFK+S[0,-1,0]->S_RAFK[0,-1,0]
k1a=100	RAFK+S[0,1,0]->S_RAFK[0,1,0]
k1a=100	RAFK+S[0,2,0]->S_RAFK[0,2,0]
k1a=100	RAFK+S[-1,0,0]->S_RAFK[-1,0,0]
k1a=100	RAFK+S[1,0,0]->S_RAFK[1,0,0]
k1a=100	RAFK+S[-1,-1,0]->S_RAFK[-1,-1,0]
k1a=100	RAFK+S[-1,1,0]->S_RAFK[-1,1,0]
k1a=100	RAFK+S[1,-1,0]->S_RAFK[1,-1,0]
k1a=100	RAFK+S[1,1,0]->S_RAFK[1,1,0]

k1a=100	RAFK+S[-1,2,0]->S_RAFK[-1,2,0]
k1a=100	RAFK+S[1,2,0]->S_RAFK[1,2,0]
k1a=100	RAFK+S[2,0,0]->S_RAFK[2,0,0]
k1a=100	RAFK+S[2,-1,0]->S_RAFK[2,-1,0]
k1a=100	RAFK+S[2,1,0]->S_RAFK[2,1,0]
k1a=100	RAFK+S[2,2,0]->S_RAFK[2,2,0]
k2=0.1	K_RAFP[3,1]->RAFP+K[3,0]
k3=0.1	K_K[2,0,3,1]->K[2,1]+K[3,1]
k3=0.1	S[0,0,1]->S[0,1,1]
k3=0.1	S[-1,0,1]->S[-1,1,1]
k3=0.1	S[1,0,1]->S[1,1,1]
k3=0.1	S[2,0,1]->S[2,1,1]
k4=0.1	K_MEKP[2,1]->MEKP+K[2,0]
k5=0.1	K_K[2,1,3,1]->K[2,2]+K[3,1]
k5a=0.1	S[0,1,1]->S[0,2,1]
k5a=0.1	S[-1,1,1]->S[-1,2,1]
k5a=0.1	S[1,1,1]->S[1,2,1]
k5a=0.1	S[2,1,1]->S[2,2,1]
k6=0.1	K_MEKP[2,2]->MEKP+K[2,1]
k7=0.1	K_K[1,0,2,2]->K[1,1]+K[2,2]
k7=0.1	S[0,2,0]->S[1,2,0]
k7=0.1	S[0,2,-1]->S[1,2,-1]
k7=0.1	S[0,2,1]->S[1,2,1]
k8=0.1	K_MAPKP[1,1]->MAPKP+K[1,0]
k9=0.1	K_K[1,1,2,2]->K[1,2]+K[2,2]
k9a=0.1	S[1,2,0]->S[2,2,0]
k9a=0.1	S[1,2,-1]->S[2,2,-1]
k9a=0.1	S[1,2,1]->S[2,2,1]
koff=0.5	S[0,0,0]->K[1,0]+S[-1,0,0]
koff=0.5	S[0,0,0]->K[2,0]+S[0,-1,0]
koff=0.5	S[0,0,0]->K[3,0]+S[0,0,-1]
koff=0.5	S[0,0,-1]->K[1,0]+S[-1,0,-1]
koff=0.5	S[0,0,1]->K[1,0]+S[-1,0,1]
koff=0.5	S[0,0,-1]->K[2,0]+S[0,-1,-1]
koff=0.5	S[0,0,1]->K[2,0]+S[0,-1,1]
koff=0.5	S[0,-1,0]->K[1,0]+S[-1,-1,0]
koff=0.5	S[0,1,0]->K[1,0]+S[-1,1,0]
koff=0.5	S[0,-1,0]->K[3,0]+S[0,-1,-1]
koff=0.5	S[0,1,0]->K[3,0]+S[0,1,-1]
koff=0.5	S[0,-1,-1]->K[1,0]+S[-1,-1,-1]
koff=0.5	S[0,-1,1]->K[1,0]+S[-1,-1,1]
koff=0.5	S[0,1,-1]->K[1,0]+S[-1,1,-1]
koff=0.5	S[0,1,1]->K[1,0]+S[-1,1,1]

koff=0.5	S[0,2,0]->K[1,0]+S[-1,2,0]
koff=0.5	S[0,2,0]->K[3,0]+S[0,2,-1]
koff=0.5	S[0,2,-1]->K[1,0]+S[-1,2,-1]
koff=0.5	S[0,2,1]->K[1,0]+S[-1,2,1]
koff=0.5	S[-1,0,0]->K[2,0]+S[-1,-1,0]
koff=0.5	S[1,0,0]->K[2,0]+S[1,-1,0]
koff=0.5	S[-1,0,0]->K[3,0]+S[-1,0,-1]
koff=0.5	S[1,0,0]->K[3,0]+S[1,0,-1]
koff=0.5	S[-1,0,-1]->K[2,0]+S[-1,-1,-1]
koff=0.5	S[-1,0,1]->K[2,0]+S[-1,-1,1]
koff=0.5	S[1,0,-1]->K[2,0]+S[1,-1,-1]
koff=0.5	S[1,0,1]->K[2,0]+S[1,-1,1]
koff=0.5	S[-1,-1,0]->K[3,0]+S[-1,-1,-1]
koff=0.5	S[-1,1,0]->K[3,0]+S[-1,1,-1]
koff=0.5	S[1,-1,0]->K[3,0]+S[1,-1,-1]
koff=0.5	S[1,1,0]->K[3,0]+S[1,1,-1]
koff=0.5	S[-1,2,0]->K[3,0]+S[-1,2,-1]
koff=0.5	S[1,2,0]->K[3,0]+S[1,2,-1]
koff=0.5	S[2,0,0]->K[2,0]+S[2,-1,0]
koff=0.5	S[2,0,0]->K[3,0]+S[2,0,-1]
koff=0.5	S[2,0,-1]->K[2,0]+S[2,-1,-1]
koff=0.5	S[2,0,1]->K[2,0]+S[2,-1,1]
koff=0.5	S[2,-1,0]->K[3,0]+S[2,-1,-1]
koff=0.5	S[2,1,0]->K[3,0]+S[2,1,-1]
koff=0.5	S[2,2,0]->K[3,0]+S[2,2,-1]
kon=10	K[1,0]+S[-1,0,0]->S[0,0,0]
kon=10	K[1,0]+S[-1,0,-1]->S[0,0,-1]
kon=10	K[1,0]+S[-1,0,1]->S[0,0,1]
kon=10	K[1,0]+S[-1,-1,0]->S[0,-1,0]
kon=10	K[1,0]+S[-1,1,0]->S[0,1,0]
kon=10	K[1,0]+S[-1,-1,-1]->S[0,-1,-1]
kon=10	K[1,0]+S[-1,-1,1]->S[0,-1,1]
kon=10	K[1,0]+S[-1,1,-1]->S[0,1,-1]
kon=10	K[1,0]+S[-1,1,1]->S[0,1,1]
kon=10	K[1,0]+S[-1,2,0]->S[0,2,0]
kon=10	K[1,0]+S[-1,2,-1]->S[0,2,-1]
kon=10	K[1,0]+S[-1,2,1]->S[0,2,1]
kon=10	K[2,0]+S[0,-1,0]->S[0,0,0]
kon=10	K[2,0]+S[0,-1,-1]->S[0,0,-1]
kon=10	K[2,0]+S[0,-1,1]->S[0,0,1]
kon=10	K[2,0]+S[-1,-1,0]->S[-1,0,0]
kon=10	K[2,0]+S[1,-1,0]->S[1,0,0]
kon=10	K[2,0]+S[-1,-1,-1]->S[-1,0,-1]

kon=10	K[2,0]+S[-1,-1,1]->S[-1,0,1]
kon=10	K[2,0]+S[1,-1,-1]->S[1,0,-1]
kon=10	K[2,0]+S[1,-1,1]->S[1,0,1]
kon=10	K[2,0]+S[2,-1,0]->S[2,0,0]
kon=10	K[2,0]+S[2,-1,-1]->S[2,0,-1]
kon=10	K[2,0]+S[2,-1,1]->S[2,0,1]
kon=10	K[3,0]+S[0,0,-1]->S[0,0,0]
kon=10	K[3,0]+S[0,-1,-1]->S[0,-1,0]
kon=10	K[3,0]+S[0,1,-1]->S[0,1,0]
kon=10	K[3,0]+S[0,2,-1]->S[0,2,0]
kon=10	K[3,0]+S[-1,0,-1]->S[-1,0,0]
kon=10	K[3,0]+S[1,0,-1]->S[1,0,0]
kon=10	K[3,0]+S[-1,-1,-1]->S[-1,-1,0]
kon=10	K[3,0]+S[-1,1,-1]->S[-1,1,0]
kon=10	K[3,0]+S[1,-1,-1]->S[1,-1,0]
kon=10	K[3,0]+S[1,1,-1]->S[1,1,0]
kon=10	K[3,0]+S[-1,2,-1]->S[-1,2,0]
kon=10	K[3,0]+S[1,2,-1]->S[1,2,0]
kon=10	K[3,0]+S[2,0,-1]->S[2,0,0]
kon=10	K[3,0]+S[2,-1,-1]->S[2,-1,0]
kon=10	K[3,0]+S[2,1,-1]->S[2,1,0]
kon=10	K[3,0]+S[2,2,-1]->S[2,2,0]
kpoff=0.05	S[0,0,1]->K[3,1]+S[0,0,-1]
kpoff=0.05	S[0,1,0]->K[2,1]+S[0,-1,0]
kpoff=0.05	S[0,1,-1]->K[2,1]+S[0,-1,-1]
kpoff=0.05	S[0,1,1]->K[2,1]+S[0,-1,1]
kpoff=0.05	S[0,-1,1]->K[3,1]+S[0,-1,-1]
kpoff=0.05	S[0,1,1]->K[3,1]+S[0,1,-1]
kpoff=0.05	S[0,2,0]->K[2,2]+S[0,-1,0]
kpoff=0.05	S[0,2,-1]->K[2,2]+S[0,-1,-1]
kpoff=0.05	S[0,2,1]->K[2,2]+S[0,-1,1]
kpoff=0.05	S[0,2,1]->K[3,1]+S[0,2,-1]
kpoff=0.05	S[1,0,0]->K[1,1]+S[-1,0,0]
kpoff=0.05	S[1,0,-1]->K[1,1]+S[-1,0,-1]
kpoff=0.05	S[1,0,1]->K[1,1]+S[-1,0,1]
kpoff=0.05	S[-1,0,1]->K[3,1]+S[-1,0,-1]
kpoff=0.05	S[1,0,1]->K[3,1]+S[1,0,-1]
kpoff=0.05	S[1,-1,0]->K[1,1]+S[-1,-1,0]
kpoff=0.05	S[1,1,0]->K[1,1]+S[-1,1,0]
kpoff=0.05	S[-1,1,0]->K[2,1]+S[-1,-1,0]
kpoff=0.05	S[1,1,0]->K[2,1]+S[1,-1,0]
kpoff=0.05	S[1,-1,-1]->K[1,1]+S[-1,-1,-1]
kpoff=0.05	S[1,-1,1]->K[1,1]+S[-1,-1,1]

kpoff=0.05	S[1,1,-1]->K[1,1]+S[-1,1,-1]
kpoff=0.05	S[1,1,1]->K[1,1]+S[-1,1,1]
kpoff=0.05	S[-1,1,-1]->K[2,1]+S[-1,-1,-1]
kpoff=0.05	S[-1,1,1]->K[2,1]+S[-1,-1,1]
kpoff=0.05	S[1,1,-1]->K[2,1]+S[1,-1,-1]
kpoff=0.05	S[1,1,1]->K[2,1]+S[1,-1,1]
kpoff=0.05	S[-1,-1,1]->K[3,1]+S[-1,-1,-1]
kpoff=0.05	S[-1,1,1]->K[3,1]+S[-1,1,-1]
kpoff=0.05	S[1,-1,1]->K[3,1]+S[1,-1,-1]
kpoff=0.05	S[1,1,1]->K[3,1]+S[1,1,-1]
kpoff=0.05	S[1,2,0]->K[1,1]+S[-1,2,0]
kpoff=0.05	S[-1,2,0]->K[2,2]+S[-1,-1,0]
kpoff=0.05	S[1,2,0]->K[2,2]+S[1,-1,0]
kpoff=0.05	S[1,2,-1]->K[1,1]+S[-1,2,-1]
kpoff=0.05	S[1,2,1]->K[1,1]+S[-1,2,1]
kpoff=0.05	S[-1,2,-1]->K[2,2]+S[-1,-1,-1]
kpoff=0.05	S[-1,2,1]->K[2,2]+S[-1,-1,1]
kpoff=0.05	S[1,2,-1]->K[2,2]+S[1,-1,-1]
kpoff=0.05	S[1,2,1]->K[2,2]+S[1,-1,1]
kpoff=0.05	S[-1,2,1]->K[3,1]+S[-1,2,-1]
kpoff=0.05	S[1,2,1]->K[3,1]+S[1,2,-1]
kpoff=0.05	S[2,0,0]->K[1,2]+S[-1,0,0]
kpoff=0.05	S[2,0,-1]->K[1,2]+S[-1,0,-1]
kpoff=0.05	S[2,0,1]->K[1,2]+S[-1,0,1]
kpoff=0.05	S[2,0,1]->K[3,1]+S[2,0,-1]
kpoff=0.05	S[2,-1,0]->K[1,2]+S[-1,-1,0]
kpoff=0.05	S[2,1,0]->K[1,2]+S[-1,1,0]
kpoff=0.05	S[2,1,0]->K[2,1]+S[2,-1,0]
kpoff=0.05	S[2,-1,-1]->K[1,2]+S[-1,-1,-1]
kpoff=0.05	S[2,-1,1]->K[1,2]+S[-1,-1,1]
kpoff=0.05	S[2,1,-1]->K[1,2]+S[-1,1,-1]
kpoff=0.05	S[2,1,1]->K[1,2]+S[-1,1,1]
kpoff=0.05	S[2,1,-1]->K[2,1]+S[2,-1,-1]
kpoff=0.05	S[2,1,1]->K[2,1]+S[2,-1,1]
kpoff=0.05	S[2,-1,1]->K[3,1]+S[2,-1,-1]
kpoff=0.05	S[2,1,1]->K[3,1]+S[2,1,-1]
kpoff=0.05	S[2,2,0]->K[1,2]+S[-1,2,0]
kpoff=0.05	S[2,2,0]->K[2,2]+S[2,-1,0]
kpoff=0.05	S[2,2,-1]->K[1,2]+S[-1,2,-1]
kpoff=0.05	S[2,2,1]->K[1,2]+S[-1,2,1]
kpoff=0.05	S[2,2,-1]->K[2,2]+S[2,-1,-1]
kpoff=0.05	S[2,2,1]->K[2,2]+S[2,-1,1]
kpoff=0.05	S[2,2,1]->K[3,1]+S[2,2,-1]

kpon=0	K[1,1]+S[-1,0,0]->S[1,0,0]
kpon=0	K[1,1]+S[-1,0,-1]->S[1,0,-1]
kpon=0	K[1,1]+S[-1,0,1]->S[1,0,1]
kpon=0	K[1,1]+S[-1,-1,0]->S[1,-1,0]
kpon=0	K[1,1]+S[-1,1,0]->S[1,1,0]
kpon=0	K[1,1]+S[-1,-1,-1]->S[1,-1,-1]
kpon=0	K[1,1]+S[-1,-1,1]->S[1,-1,1]
kpon=0	K[1,1]+S[-1,1,-1]->S[1,1,-1]
kpon=0	K[1,1]+S[-1,1,1]->S[1,1,1]
kpon=0	K[1,1]+S[-1,2,0]->S[1,2,0]
kpon=0	K[1,1]+S[-1,2,-1]->S[1,2,-1]
kpon=0	K[1,1]+S[-1,2,1]->S[1,2,1]
kpon=0	K[1,2]+S[-1,0,0]->S[2,0,0]
kpon=0	K[1,2]+S[-1,0,-1]->S[2,0,-1]
kpon=0	K[1,2]+S[-1,0,1]->S[2,0,1]
kpon=0	K[1,2]+S[-1,-1,0]->S[2,-1,0]
kpon=0	K[1,2]+S[-1,1,0]->S[2,1,0]
kpon=0	K[1,2]+S[-1,-1,-1]->S[2,-1,-1]
kpon=0	K[1,2]+S[-1,-1,1]->S[2,-1,1]
kpon=0	K[1,2]+S[-1,1,-1]->S[2,1,-1]
kpon=0	K[1,2]+S[-1,1,1]->S[2,1,1]
kpon=0	K[1,2]+S[-1,2,0]->S[2,2,0]
kpon=0	K[1,2]+S[-1,2,-1]->S[2,2,-1]
kpon=0	K[1,2]+S[-1,2,1]->S[2,2,1]
kpon=0	K[2,1]+S[0,-1,0]->S[0,1,0]
kpon=0	K[2,1]+S[0,-1,-1]->S[0,1,-1]
kpon=0	K[2,1]+S[0,-1,1]->S[0,1,1]
kpon=0	K[2,1]+S[-1,-1,0]->S[-1,1,0]
kpon=0	K[2,1]+S[1,-1,0]->S[1,1,0]
kpon=0	K[2,1]+S[-1,-1,-1]->S[-1,1,-1]
kpon=0	K[2,1]+S[-1,-1,1]->S[-1,1,1]
kpon=0	K[2,1]+S[1,-1,-1]->S[1,1,-1]
kpon=0	K[2,1]+S[1,-1,1]->S[1,1,1]
kpon=0	K[2,1]+S[2,-1,0]->S[2,1,0]
kpon=0	K[2,1]+S[2,-1,-1]->S[2,1,-1]
kpon=0	K[2,1]+S[2,-1,1]->S[2,1,1]
kpon=0	K[2,2]+S[0,-1,0]->S[0,2,0]
kpon=0	K[2,2]+S[0,-1,-1]->S[0,2,-1]
kpon=0	K[2,2]+S[0,-1,1]->S[0,2,1]
kpon=0	K[2,2]+S[-1,-1,0]->S[-1,2,0]
kpon=0	K[2,2]+S[1,-1,0]->S[1,2,0]
kpon=0	K[2,2]+S[-1,-1,-1]->S[-1,2,-1]
kpon=0	K[2,2]+S[-1,-1,1]->S[-1,2,1]

kpon=0	K[2,2]+S[1,-1,-1]->S[1,2,-1]
kpon=0	K[2,2]+S[1,-1,1]->S[1,2,1]
kpon=0	K[2,2]+S[2,-1,0]->S[2,2,0]
kpon=0	K[2,2]+S[2,-1,-1]->S[2,2,-1]
kpon=0	K[2,2]+S[2,-1,1]->S[2,2,1]
kpon=0	K[3,1]+S[0,0,-1]->S[0,0,1]
kpon=0	K[3,1]+S[0,-1,-1]->S[0,-1,1]
kpon=0	K[3,1]+S[0,1,-1]->S[0,1,1]
kpon=0	K[3,1]+S[0,2,-1]->S[0,2,1]
kpon=0	K[3,1]+S[-1,0,-1]->S[-1,0,1]
kpon=0	K[3,1]+S[1,0,-1]->S[1,0,1]
kpon=0	K[3,1]+S[-1,-1,-1]->S[-1,-1,1]
kpon=0	K[3,1]+S[-1,1,-1]->S[-1,1,1]
kpon=0	K[3,1]+S[1,-1,-1]->S[1,-1,1]
kpon=0	K[3,1]+S[1,1,-1]->S[1,1,1]
kpon=0	K[3,1]+S[-1,2,-1]->S[-1,2,1]
kpon=0	K[3,1]+S[1,2,-1]->S[1,2,1]
kpon=0	K[3,1]+S[2,0,-1]->S[2,0,1]
kpon=0	K[3,1]+S[2,-1,-1]->S[2,-1,1]
kpon=0	K[3,1]+S[2,1,-1]->S[2,1,1]
kpon=0	K[3,1]+S[2,2,-1]->S[2,2,1]

Variable	IC	ODE
MAPKP	0.3	MAPKP'[t]==-(a8*MAPKP[t]*K[1,1][t])-a10*MAPKP[t]*K[1,2][t]+d8*K_MAPKP[1,1][t]+
MEKP	0.2	MEKP'[t]==-(a4*MEKP[t]*K[2,1][t])-a6*MEKP[t]*K[2,2][t]+d4*K_MEKP[2,1][t]+k4*K

RAFK	0.1	RAFK'[t]==-(a1*RAFK[t]*K[3,0][t])+d1*K_RAFK[3,0][t]+k1*

k1a*RAFK[t]*S[-1,-1,0][t]-
k1a*RAFK[t]*S[-1,0,0][t]-
k1a*RAFK[t]*S[-1,1,0][t]-
k1a*RAFK[t]*S[-1,2,0][t]-
k1a*RAFK[t]*S[0,-1,0][t]-
k1a*RAFK[t]*S[0,0,0][t]-
k1a*RAFK[t]*S[0,1,0][t]-
k1a*RAFK[t]*S[0,2,0][t]-
k1a*RAFK[t]*S[1,-1,0][t]-
k1a*RAFK[t]*S[1,0,0][t]-
k1a*RAFK[t]*S[1,1,0][t]-
k1a*RAFK[t]*S[1,2,0][t]-
k1a*RAFK[t]*S[2,-1,0][t]-
k1a*RAFK[t]*S[2,0,0][t]-
k1a*RAFK[t]*S[2,1,0][t]-
k1a*RAFK[t]*S[2,2,0][t]+d1a*S_RAFK[-
1,-1,0][t]+k1*S_RAFK[-1,-
1,0][t]+d1a*S_RAFK[-
1,0,0][t]+k1*S_RAFK[-
1,0,0][t]+d1a*S_RAFK[-
1,1,0][t]+k1*S_RAFK[-
1,1,0][t]+d1a*S_RAFK[-
1,2,0][t]+k1*S_RAFK[-
1,2,0][t]+d1a*S_RAFK[0,-
1,0][t]+k1*S_RAFK[0,-
1,0][t]+d1a*S_RAFK[0,0,0][t]+k1*S_RAFK[0,0,0]
1,0][t]+k1*S_RAFK[1,-
1,0][t]+d1a*S_RAFK[1,0,0][t]+k1*S_RAFK[1,0,0]
1,0][t]+k1*S_RAFK[2,-
1,0][t]+d1a*S_RAFK[2,0,0][t]+k1*S_RAFK[2,0,0]

RAFP	0.3	RAFP'[t]==-(a2*RAFP[t]*K[3,1][t])+d2*K_RAFP[3,1][t]+k2*I

K[1,0] 0.4

(K[1,0])'[t]==-
(a7*K[1,0][t]*K[2,2][t])+d7*K_K[1,0,2,2][t]+k8*K
kon*K[1,0][t]*S[-1,-1,-
1][t]-kon*K[1,0][t]*S[-1,-
1,0][t]-kon*K[1,0][t]*S[-1,-
1,1][t]-kon*K[1,0][t]*S[-
1,0,-1][t]-kon*K[1,0][t]*S[-
1,0,0][t]-kon*K[1,0][t]*S[-
1,0,1][t]-kon*K[1,0][t]*S[-
1,1,-1][t]-kon*K[1,0][t]*S[-
1,1,0][t]-kon*K[1,0][t]*S[-
1,1,1][t]-kon*K[1,0][t]*S[-
1,2,-1][t]-kon*K[1,0][t]*S[-
1,2,0][t]-kon*K[1,0][t]*S[-
1,2,1][t]+koff*S[0,-
1,-1][t]+koff*S[0,-
1,0][t]+koff*S[0,-
1,1][t]+koff*S[0,0,-
1][t]+koff*S[0,0,0][t]+koff*S[0,0,1][t]+koff*S[0,1,
1][t]+koff*S[0,1,0][t]+koff*S[0,1,1][t]+koff*S[0,2,
1][t]+koff*S[0,2,0][t]+koff*S[0,2,1][t]

| K[1,1] | 0 | (K[1,1])'[t]==-(a8*MAPKP[t]*K[1,1][t])-a9*K[1,1][t]*K[2,2][t]+k7*K_K[1,0,2,2][t]+d9*K_ kpon*K[1,1][t]*S[-1,-1,-1][t]-kpon*K[1,1][t]*S[-1,-1,0][t]-kpon*K[1,1][t]*S[-1,-1,1][t]-kpon*K[1,1][t]*S[-1,0,-1][t]-kpon*K[1,1][t]*S[-1,0,0][t]-kpon*K[1,1][t]*S[-1,0,1][t]-kpon*K[1,1][t]*S[-1,1,-1][t]-kpon*K[1,1][t]*S[-1,1,0][t]-kpon*K[1,1][t]*S[-1,1,1][t]-kpon*K[1,1][t]*S[-1,2,-1][t]-kpon*K[1,1][t]*S[-1,2,0][t]-kpon*K[1,1][t]*S[-1,2,1][t]+kpoff*S[1,-1,-1][t]+kpoff*S[1,-1,0][t]+kpoff*S[1,-1,1][t]+kpoff*S[1,0,-1][t]+kpoff*S[1,0,0][t]+kpoff*S[1,0,1][t]+kpoff*S[1][t]+kpoff*S[1,1,0][t]+kpoff*S[1,1,1][t]+kpoff*S[1][t]+kpoff*S[1,2,0][t]+kpoff*S[1,2,1][t] |

| K[1,2] | 0 | (K[1,2])'[t]==-(a10*MAPKP[t]*K[1,2][t])+k9*K_K[1,1,2,2][t]+d kpon*K[1,2][t]*S[-1,-1,-1][t]-kpon*K[1,2][t]*S[-1,-1,0][t]-kpon*K[1,2][t]*S[-1,-1,1][t]-kpon*K[1,2][t]*S[-1,0,-1][t]-kpon*K[1,2][t]*S[-1,0,0][t]-kpon*K[1,2][t]*S[-1,0,1][t]-kpon*K[1,2][t]*S[-1,1,-1][t]-kpon*K[1,2][t]*S[-1,1,0][t]-kpon*K[1,2][t]*S[-1,1,1][t]-kpon*K[1,2][t]*S[-1,2,-1][t]-kpon*K[1,2][t]*S[-1,2,0][t]-kpon*K[1,2][t]*S[-1,2,1][t]+kpoff*S[2,-1,-1][t]+kpoff*S[2,-1,0][t]+kpoff*S[2,-1,1][t]+kpoff*S[2,0,-1][t]+kpoff*S[2,0,0][t]+kpoff*S[2,0,1][t]+kpoff*S[2,1,-1][t]+kpoff*S[2,1,0][t]+kpoff*S[2,1,1][t]+kpoff*S[2,2,-1][t]+kpoff*S[2,2,0][t]+kpoff*S[2,2,1][t] |

| K[2,0] | 0.2 | (K[2,0])'[t]==-(a3*K[2,0][t]*K[3,1][t])+d3*K_K[2,0,3,1][t]+k4*K
kon*K[2,0][t]*S[-1,-1,-1][t]-kon*K[2,0][t]*S[-1,-1,0][t]-kon*K[2,0][t]*S[-1,-1,1][t]+koff*S[-1,0,-1][t]+koff*S[-1,0,0][t]+koff*S[-1,0,1][t]-kon*K[2,0][t]*S[0,-1,-1][t]-kon*K[2,0][t]*S[0,-1,0][t]-kon*K[2,0][t]*S[0,-1,1][t]+koff*S[0,0,-1][t]+koff*S[0,0,0][t]+koff*S[0,0,1][t]-kon*K[2,0][t]*S[1,-1,-1][t]-kon*K[2,0][t]*S[1,-1,0][t]-kon*K[2,0][t]*S[1,-1,1][t]+koff*S[1,0,-1][t]+koff*S[1,0,0][t]+koff*S[1,0,1][t]-kon*K[2,0][t]*S[2,-1,-1][t]-kon*K[2,0][t]*S[2,-1,0][t]-kon*K[2,0][t]*S[2,-1,1][t]+koff*S[2,0,-1][t]+koff*S[2,0,0][t]+koff*S[2,0,1][t] |

| K[2,1] | 0 | (K[2,1])'[t]==-(a4*MEKP[t]*K[2,1][t])-a5*K[2,1][t]*K[3,1][t]+k3*K_K[2,0,3,1][t]+d5*K_kpon*K[2,1][t]*S[-1,-1,-1][t]-kpon*K[2,1][t]*S[-1,-1,0][t]-kpon*K[2,1][t]*S[-1,-1,1][t]+kpoff*S[-1,1,-1][t]+kpoff*S[-1,1,0][t]+kpoff*S[-1,1,1][t]-kpon*K[2,1][t]*S[0,-1,-1][t]-kpon*K[2,1][t]*S[0,-1,0][t]-kpon*K[2,1][t]*S[0,-1,1][t]+kpoff*S[0,1,-1][t]+kpoff*S[0,1,0][t]+kpoff*S[0,1,1][t]-kpon*K[2,1][t]*S[1,-1,-1][t]-kpon*K[2,1][t]*S[1,-1,0][t]-kpon*K[2,1][t]*S[1,-1,1][t]+kpoff*S[1,1,-1][t]+kpoff*S[1,1,0][t]+kpoff*S[1,1,1][t]-kpon*K[2,1][t]*S[2,-1,-1][t]-kpon*K[2,1][t]*S[2,-1,0][t]-kpon*K[2,1][t]*S[2,-1,1][t]+kpoff*S[2,1,-1][t]+kpoff*S[2,1,0][t]+kpoff*S[2,1,1][t] |

| K[2,2] | 0 | (K[2,2])'[t]==-(a6*MEKP[t]*K[2,2][t])-a7*K[1,0][t]*K[2,2][t]-a9*K[1,1][t]*K[2,2][t]+d7*K_K[1,0,2,2][t]+k7*K_ kpon*K[2,2][t]*S[-1,-1,-1][t]-kpon*K[2,2][t]*S[-1,-1,0][t]-kpon*K[2,2][t]*S[-1,-1,1][t]+kpoff*S[-1,2,-1][t]+kpoff*S[-1,2,0][t]+kpoff*S[-1,2,1][t]-kpon*K[2,2][t]*S[0,-1,-1][t]-kpon*K[2,2][t]*S[0,-1,0][t]-kpon*K[2,2][t]*S[0,-1,1][t]+kpoff*S[0,2,-1][t]+kpoff*S[0,2,0][t]+kpoff*S[0,2,1][t]-kpon*K[2,2][t]*S[1,-1,-1][t]-kpon*K[2,2][t]*S[1,-1,0][t]-kpon*K[2,2][t]*S[1,-1,1][t]+kpoff*S[1,2,-1][t]+kpoff*S[1,2,0][t]+kpoff*S[1,2,1][t]-kpon*K[2,2][t]*S[2,-1,-1][t]-kpon*K[2,2][t]*S[2,-1,0][t]-kpon*K[2,2][t]*S[2,-1,1][t]+kpoff*S[2,2,-1][t]+kpoff*S[2,2,0][t]+kpoff*S[2,2,1][t] |

K[3,0]	0.3	(K[3,0])'[t]==-(a1*RAFK[t]*K[3,0][t])+d1*K_RAFK[3,0][t]+k2*kon*K[3,0][t]*S[-1,-1,-1][t]+koff*S[-1,-1,0][t]-kon*K[3,0][t]*S[-1,0,-1][t]+koff*S[-1,0,0][t]-kon*K[3,0][t]*S[-1,1,-1][t]+koff*S[-1,1,0][t]-kon*K[3,0][t]*S[-1,2,-1][t]+koff*S[-1,2,0][t]-kon*K[3,0][t]*S[0,-1,-1][t]+koff*S[0,-1,0][t]-kon*K[3,0][t]*S[0,0,-1][t]+koff*S[0,0,0][t]-kon*K[3,0][t]*S[0,1,-1][t]+koff*S[0,1,0][t]-kon*K[3,0][t]*S[0,2,-1][t]+koff*S[0,2,0][t]-kon*K[3,0][t]*S[1,-1,-1][t]+koff*S[1,-1,0][t]-kon*K[3,0][t]*S[1,0,-1][t]+koff*S[1,0,0][t]-kon*K[3,0][t]*S[1,1,-1][t]+koff*S[1,1,0][t]-kon*K[3,0][t]*S[1,2,-1][t]+koff*S[1,2,0][t]-kon*K[3,0][t]*S[2,-1,-1][t]+koff*S[2,-1,0][t]-kon*K[3,0][t]*S[2,0,-1][t]+koff*S[2,0,0][t]-kon*K[3,0][t]*S[2,1,-1][t]+koff*S[2,1,0][t]-kon*K[3,0][t]*S[2,2,-1][t]+koff*S[2,2,0][t]

K[3,1]	0	(K[3,1])'[t]==- (a2*RAFP[t]*K[3,1][t])- a3*K[2,0][t]*K[3,1][t]- a5*K[2,1][t]*K[3,1][t]+d3*K_K[2,0,3,1][t]+k3*K_ kpon*K[3,1][t]*S[-1,-1,- 1][t]+kpoff*S[-1,-1,1][t]- kpon*K[3,1][t]*S[-1,0,- 1][t]+kpoff*S[-1,0,1][t]- kpon*K[3,1][t]*S[-1,1,- 1][t]+kpoff*S[-1,1,1][t]- kpon*K[3,1][t]*S[-1,2,- 1][t]+kpoff*S[-1,2,1][t]- kpon*K[3,1][t]*S[0,-1,- 1][t]+kpoff*S[0,-1,1][t]- kpon*K[3,1][t]*S[0,0,- 1][t]+kpoff*S[0,0,1][t]- kpon*K[3,1][t]*S[0,1,- 1][t]+kpoff*S[0,1,1][t]- kpon*K[3,1][t]*S[0,2,- 1][t]+kpoff*S[0,2,1][t]- kpon*K[3,1][t]*S[1,-1,- 1][t]+kpoff*S[1,-1,1][t]- kpon*K[3,1][t]*S[1,0,- 1][t]+kpoff*S[1,0,1][t]- kpon*K[3,1][t]*S[1,1,- 1][t]+kpoff*S[1,1,1][t]- kpon*K[3,1][t]*S[1,2,- 1][t]+kpoff*S[1,2,1][t]- kpon*K[3,1][t]*S[2,-1,- 1][t]+kpoff*S[2,-1,1][t]- kpon*K[3,1][t]*S[2,0,- 1][t]+kpoff*S[2,0,1][t]- kpon*K[3,1][t]*S[2,1,- 1][t]+kpoff*S[2,1,1][t]- kpon*K[3,1][t]*S[2,2,- 1][t]+kpoff*S[2,2,1][t]
K_K[1,0,2,2]	0	(K_K[1,0,2,2])'[t]==a7*K[1,0][t]*K[2,2][t]- d7*K_K[1,0,2,2][t]- k7*K_K[1,0,2,2][t]
K_K[1,1,2,2]	0	(K_K[1,1,2,2])'[t]==a9*K[1,1][t]*K[2,2][t]- d9*K_K[1,1,2,2][t]- k9*K_K[1,1,2,2][t]

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K_K[2,0,3,1]	0	(K_K[2,0,3,1])'[t]==a3*K[2,0][t]*K[3,1][t]-d3*K_K[2,0,3,1][t]-k3*K_K[2,0,3,1][t]
K_K[2,1,3,1]	0	(K_K[2,1,3,1])'[t]==a5*K[2,1][t]*K[3,1][t]-d5*K_K[2,1,3,1][t]-k5*K_K[2,1,3,1][t]
K_MAPKP[1,1]	0	(K_MAPKP[1,1])'[t]==a8*MAPKP[t]*K[1,1][t]-d8*K_MAPKP[1,1][t]-k8*K_MAPKP[1,1][t]
K_MAPKP[1,2]	0	(K_MAPKP[1,2])'[t]==a10*MAPKP[t]*K[1,2][t]-d10*K_MAPKP[1,2][t]-k10*K_MAPKP[1,2][t]
K_MEKP[2,1]	0	(K_MEKP[2,1])'[t]==a4*MEKP[t]*K[2,1][t]-d4*K_MEKP[2,1][t]-k4*K_MEKP[2,1][t]
K_MEKP[2,2]	0	(K_MEKP[2,2])'[t]==a6*MEKP[t]*K[2,2][t]-d6*K_MEKP[2,2][t]-k6*K_MEKP[2,2][t]
K_RAFK[3,0]	0	(K_RAFK[3,0])'[t]==a1*RAFK[t]*K[3,0][t]-d1*K_RAFK[3,0][t]-k1*K_RAFK[3,0][t]
K_RAFP[3,1]	0	(K_RAFP[3,1])'[t]==a2*RAFP[t]*K[3,1][t]-d2*K_RAFP[3,1][t]-k2*K_RAFP[3,1][t]
S[-1,-1,-1]	0.1	(S[-1,-1,-1])'[t]==-(kon*K[1,0][t]*S[-1,-1,-1][t])-kpon*K[1,1][t]*S[-1,-1,-1][t]-kpon*K[1,2][t]*S[-1,-1,-1][t]-kon*K[2,0][t]*S[-1,-1,-1][t]-kpon*K[2,1][t]*S[-1,-1,-1][t]-kpon*K[2,2][t]*S[-1,-1,-1][t]-kon*K[3,0][t]*S[-1,-1,-1][t]-kpon*K[3,1][t]*S[-1,-1,-1][t]+koff*S[-1,-1,0][t]+kpoff*S[-1,-1,1][t]+koff*S[-1,0,-1][t]+kpoff*S[-1,1,-1][t]+kpoff*S[-1,2,-1][t]+koff*S[0,-1,-1][t]+kpoff*S[1,-1,-1][t]+kpoff*S[2,-1,-1][t]

S[-1,-1,0]	0	(S[-1,-1,0])'[t]==kon*K[3,0][t]*S[-1,-1,-1][t]-koff*S[-1,-1,0][t]-k1a*RAFK[t]*S[-1,-1,0][t]-kon*K[1,0][t]*S[-1,-1,0][t]-kpon*K[1,1][t]*S[-1,-1,0][t]-kpon*K[1,2][t]*S[-1,-1,0][t]-kon*K[2,0][t]*S[-1,-1,0][t]-kpon*K[2,1][t]*S[-1,-1,0][t]-kpon*K[2,2][t]*S[-1,-1,0][t]+koff*S[-1,0,0][t]+kpoff*S[-1,1,0][t]+kpoff*S[-1,2,0][t]+koff*S[0,-1,0][t]+kpoff*S[1,-1,0][t]+kpoff*S[2,-1,0][t]+d1a*S_RAFK[-1,-1,0][t]
S[-1,-1,1]	0	(S[-1,-1,1])'[t]==kpon*K[3,1][t]*S[-1,-1,-1][t]-kpoff*S[-1,-1,1][t]-kon*K[1,0][t]*S[-1,-1,1][t]-kpon*K[1,1][t]*S[-1,-1,1][t]-kpon*K[1,2][t]*S[-1,-1,1][t]-kon*K[2,0][t]*S[-1,-1,1][t]-kpon*K[2,1][t]*S[-1,-1,1][t]-kpon*K[2,2][t]*S[-1,-1,1][t]+koff*S[-1,0,1][t]+kpoff*S[-1,1,1][t]+kpoff*S[-1,2,1][t]+koff*S[0,-1,1][t]+kpoff*S[1,-1,1][t]+kpoff*S[2,-1,1][t]+k1*S_RAFK[-1,-1,0][t]

S[-1,0,-1]	0	(S[-1,0,-1])'[t]==kon*K[2,0][t]*S[-1,-1,-1][t]-koff*S[-1,0,-1][t]-kon*K[1,0][t]*S[-1,0,-1][t]-kpon*K[1,1][t]*S[-1,0,-1][t]-kpon*K[1,2][t]*S[-1,0,-1][t]-kon*K[3,0][t]*S[-1,0,-1][t]-kpon*K[3,1][t]*S[-1,0,-1][t]+koff*S[-1,0,0][t]+kpoff*S[-1,0,1][t]+koff*S[0,0,-1][t]+kpoff*S[1,0,-1][t]+kpoff*S[2,0,-1][t]
S[-1,0,0]	0	(S[-1,0,0])'[t]==kon*K[2,0][t]*S[-1,-1,0][t]+kon*K[3,0][t]*S[-1,0,-1][t]-2*koff*S[-1,0,0][t]-k1a*RAFK[t]*S[-1,0,0][t]-kon*K[1,0][t]*S[-1,0,0][t]-kpon*K[1,1][t]*S[-1,0,0][t]-kpon*K[1,2][t]*S[-1,0,0][t]+koff*S[0,0,0][t]+kpoff*S[1,0,0][t]+kpoff*1,0,0][t]
S[-1,0,1]	0	(S[-1,0,1])'[t]==kon*K[2,0][t]*S[-1,-1,1][t]+kpon*K[3,1][t]*S[-1,0,-1][t]-k3*S[-1,0,1][t]-koff*S[-1,0,1][t]-kpoff*S[-1,0,1][t]-kon*K[1,0][t]*S[-1,0,1][t]-kpon*K[1,1][t]*S[-1,0,1][t]-kpon*K[1,2][t]*S[-1,0,1][t]+koff*S[0,0,1][t]+kpoff*S[1,0,1][t]+kpoff*1,0,0][t]

S[-1,1,-1]	0	(S[-1,1,-1])'[t]==kpon*K[2,1][t]*S[-1,-1,-1][t]-kpoff*S[-1,1,-1][t]-kon*K[1,0][t]*S[-1,1,-1][t]-kpon*K[1,1][t]*S[-1,1,-1][t]-kpon*K[1,2][t]*S[-1,1,-1][t]-kon*K[3,0][t]*S[-1,1,-1][t]-kpon*K[3,1][t]*S[-1,1,-1][t]+koff*S[-1,1,0][t]+kpoff*S[-1,1,1][t]+koff*S[0,1,-1][t]+kpoff*S[1,1,-1][t]+kpoff*S[2,1,-1][t]
S[-1,1,0]	0	(S[-1,1,0])'[t]==kpon*K[2,1][t]*S[-1,-1,0][t]+kon*K[3,0][t]*S[-1,1,-1][t]-koff*S[-1,1,0][t]-kpoff*S[-1,1,0][t]-k1a*RAFK[t]*S[-1,1,0][t]-kon*K[1,0][t]*S[-1,1,0][t]-kpon*K[1,1][t]*S[-1,1,0][t]-kpon*K[1,2][t]*S[-1,1,0][t]+koff*S[0,1,0][t]+kpoff*S[1,1,0][t]+kpoff*S[?,1,0][t]
S[-1,1,1]	0	(S[-1,1,1])'[t]==kpon*K[2,1][t]*S[-1,-1,1][t]+k3*S[-1,0,1][t]+kpon*K[3,1][t]*S[-1,1,-1][t]-k5a*S[-1,1,1][t]-2*kpoff*S[-1,1,1][t]-kon*K[1,0][t]*S[-1,1,1][t]-kpon*K[1,1][t]*S[-1,1,1][t]-kpon*K[1,2][t]*S[-1,1,1][t]+koff*S[0,1,1][t]+kpoff*S[1,1,1][t]+kpoff*S[?,1,0][t]

S[-1,2,-1]	0	(S[-1,2,-1])'[t]==kpon*K[2,2][t]*S[-1,-1,-1][t]-kpoff*S[-1,2,-1][t]-kon*K[1,0][t]*S[-1,2,-1][t]-kpon*K[1,1][t]*S[-1,2,-1][t]-kpon*K[1,2][t]*S[-1,2,-1][t]-kon*K[3,0][t]*S[-1,2,-1][t]-kpon*K[3,1][t]*S[-1,2,-1][t]+koff*S[-1,2,0][t]+kpoff*S[-1,2,1][t]+koff*S[0,2,-1][t]+kpoff*S[1,2,-1][t]+kpoff*S[2,2,-1][t]
S[-1,2,0]	0	(S[-1,2,0])'[t]==kpon*K[2,2][t]*S[-1,-1,0][t]+kon*K[3,0][t]*S[-1,2,-1][t]-koff*S[-1,2,0][t]-kpoff*S[-1,2,0][t]-k1a*RAFK[t]*S[-1,2,0][t]-kon*K[1,0][t]*S[-1,2,0][t]-kpon*K[1,1][t]*S[-1,2,0][t]-kpon*K[1,2][t]*S[-1,2,0][t]+koff*S[0,2,0][t]+kpoff*S[1,2,0][t]+kpoff*1,2,0][t]
S[-1,2,1]	0	(S[-1,2,1])'[t]==kpon*K[2,2][t]*S[-1,-1,1][t]+k5a*S[-1,1,1][t]+kpon*K[3,1][t]*S[-1,2,-1][t]-2*kpoff*S[-1,2,1][t]-kon*K[1,0][t]*S[-1,2,1][t]-kpon*K[1,1][t]*S[-1,2,1][t]-kpon*K[1,2][t]*S[-1,2,1][t]+koff*S[0,2,1][t]+kpoff*S[1,2,1][t]+kpoff*1,2,0][t]

S[0,-1,-1]	0	(S[0,-1,-1])'[t]==kon*K[1,0][t]*S[-1,-1,-1][t]-koff*S[0,-1,-1][t]-kon*K[2,0][t]*S[0,-1,-1][t]-kpon*K[2,1][t]*S[0,-1,-1][t]-kpon*K[2,2][t]*S[0,-1,-1][t]-kon*K[3,0][t]*S[0,-1,-1][t]-kpon*K[3,1][t]*S[0,-1,-1][t]+koff*S[0,-1,0][t]+kpoff*S[0,-1,1][t]+koff*S[0,0,-1][t]+kpoff*S[0,1,-1][t]+kpoff*S[0,2,-1][t]
S[0,-1,0]	0	(S[0,-1,0])'[t]==kon*K[1,0][t]*S[-1,-1,0][t]+kon*K[3,0][t]*S[0,-1,-1][t]-2*koff*S[0,-1,0][t]-k1a*RAFK[t]*S[0,-1,0][t]-kon*K[2,0][t]*S[0,-1,0][t]-kpon*K[2,1][t]*S[0,-1,0][t]-kpon*K[2,2][t]*S[0,-1,0][t]+koff*S[0,0,0][t]+kpoff*S[0,1,0][t]+kpoff*S[0,1,0][t]
S[0,-1,1]	0	(S[0,-1,1])'[t]==kon*K[1,0][t]*S[-1,-1,1][t]+kpon*K[3,1][t]*S[0,-1,-1][t]-koff*S[0,-1,1][t]-kpoff*S[0,-1,1][t]-kon*K[2,0][t]*S[0,-1,1][t]-kpon*K[2,1][t]*S[0,-1,1][t]-kpon*K[2,2][t]*S[0,-1,1][t]+koff*S[0,0,1][t]+kpoff*S[0,1,1][t]+kpoff*S[0,1,0][t]

S[0,0,-1]	0	(S[0,0,-1])'[t]==kon*K[1,0][t]*S[-1,0,-1][t]+kon*K[2,0][t]*S[0,-1,-1][t]-2*koff*S[0,0,-1][t]-kon*K[3,0][t]*S[0,0,-1][t]-kpon*K[3,1][t]*S[0,0,-1][t]+koff*S[0,0,0][t]+kpoff*S[0,0,1][t]
S[0,0,0]	0	(S[0,0,0])'[t]==kon*K[1,0][t]*S[-1,0,0][t]+kon*K[2,0][t]*S[0,-1,0][t]+kon*K[3,0][t]*S[0,0,-1][t]-3*koff*S[0,0,0][t]-k1a*RAFK[t]*S[0,0,0][t]+d1a*S_RAFK[0,0,0][t]
S[0,0,1]	0	(S[0,0,1])'[t]==kon*K[1,0][t]*S[-1,0,1][t]+kon*K[2,0][t]*S[0,-1,1][t]+kpon*K[3,1][t]*S[0,0,-1][t]-k3*S[0,0,1][t]-2*koff*S[0,0,1][t]-kpoff*S[0,0,1][t]+k1*S_RAFK[0,0,0][t]
S[0,1,-1]	0	(S[0,1,-1])'[t]==kon*K[1,0][t]*S[-1,1,-1][t]+kpon*K[2,1][t]*S[0,-1,-1][t]-koff*S[0,1,-1][t]-kpoff*S[0,1,-1][t]-kon*K[3,0][t]*S[0,1,-1][t]-kpon*K[3,1][t]*S[0,1,-1][t]+koff*S[0,1,0][t]+kpoff*S[0,1,1][t]
S[0,1,0]	0	(S[0,1,0])'[t]==kon*K[1,0][t]*S[-1,1,0][t]+kpon*K[2,1][t]*S[0,-1,0][t]+kon*K[3,0][t]*S[0,1,-1][t]-2*koff*S[0,1,0][t]-kpoff*S[0,1,0][t]-k1a*RAFK[t]*S[0,1,0][t]+d1a*S_RAFK[0,1,0][t]
S[0,1,1]	0	(S[0,1,1])'[t]==kon*K[1,0][t]*S[-1,1,1][t]+kpon*K[2,1][t]*S[0,-1,1][t]+k3*S[0,0,1][t]+kpon*K[3,1][t]*S[0,1,-1][t]-k5a*S[0,1,1][t]-koff*S[0,1,1][t]-2*kpoff*S[0,1,1][t]+k1*S_RAFK[0,1,0][t]

S[0,2,-1]	0	(S[0,2,-1])'[t]==kon*K[1,0][t]*S[-1,2,-1][t]+kpon*K[2,2][t]*S[0,-1,-1][t]-k7*S[0,2,-1][t]-koff*S[0,2,-1][t]-kpoff*S[0,2,-1][t]-kon*K[3,0][t]*S[0,2,-1][t]-kpon*K[3,1][t]*S[0,2,-1][t]+koff*S[0,2,0][t]+kpoff*S[0,2,1][t]
S[0,2,0]	0	(S[0,2,0])'[t]==kon*K[1,0][t]*S[-1,2,0][t]+kpon*K[2,2][t]*S[0,-1,0][t]+kon*K[3,0][t]*S[0,2,-1][t]-k7*S[0,2,0][t]-2*koff*S[0,2,0][t]-kpoff*S[0,2,0][t]-k1a*RAFK[t]*S[0,2,0][t]+d1a*S_RAFK[0,2,0][t]
S[0,2,1]	0	(S[0,2,1])'[t]==kon*K[1,0][t]*S[-1,2,1][t]+kpon*K[2,2][t]*S[0,-1,1][t]+k5a*S[0,1,1][t]+kpon*K[3,1][t]*S[0,2,-1][t]-k7*S[0,2,1][t]-koff*S[0,2,1][t]-2*kpoff*S[0,2,1][t]+k1*S_RAFK[0,2,0][t]
S[1,-1,-1]	0	(S[1,-1,-1])'[t]==kpon*K[1,1][t]*S[-1,-1,-1][t]-kpoff*S[1,-1,-1][t]-kon*K[2,0][t]*S[1,-1,-1][t]-kpon*K[2,1][t]*S[1,-1,-1][t]-kpon*K[2,2][t]*S[1,-1,-1][t]-kon*K[3,0][t]*S[1,-1,-1][t]-kpon*K[3,1][t]*S[1,-1,-1][t]+koff*S[1,-1,0][t]+kpoff*S[1,-1,1][t]+koff*S[1,0,-1][t]+kpoff*S[1,1,-1][t]+kpoff*S[1,2,-1][t]

S[1,-1,0]	0	(S[1,-1,0])'[t]==kpon*K[1,1][t]*S[-1,-1,0][t]+kon*K[3,0][t]*S[1,-1,-1][t]-koff*S[1,-1,0][t]-kpoff*S[1,-1,0][t]-k1a*RAFK[t]*S[1,-1,0][t]-kon*K[2,0][t]*S[1,-1,0][t]-kpon*K[2,1][t]*S[1,-1,0][t]-kpon*K[2,2][t]*S[1,-1,0][t]+koff*S[1,0,0][t]+kpoff*S[1,1,0][t]+kpoff*S 1,0][t]
S[1,-1,1]	0	(S[1,-1,1])'[t]==kpon*K[1,1][t]*S[-1,-1,1][t]+kpon*K[3,1][t]*S[1,-1,-1][t]-2*kpoff*S[1,-1,1][t]-kon*K[2,0][t]*S[1,-1,1][t]-kpon*K[2,1][t]*S[1,-1,1][t]-kpon*K[2,2][t]*S[1,-1,1][t]+koff*S[1,0,1][t]+kpoff*S[1,1,1][t]+kpoff*S 1,0][t]
S[1,0,-1]	0	(S[1,0,-1])'[t]==kpon*K[1,1][t]*S[-1,0,-1][t]+kon*K[2,0][t]*S[1,-1,-1][t]-koff*S[1,0,-1][t]-kpoff*S[1,0,-1][t]-kon*K[3,0][t]*S[1,0,-1][t]-kpon*K[3,1][t]*S[1,0,-1][t]+koff*S[1,0,0][t]+kpoff*S[1,0,1][t]
S[1,0,0]	0	(S[1,0,0])'[t]==kpon*K[1,1][t]*S[-1,0,0][t]+kon*K[2,0][t]*S[1,-1,0][t]+kon*K[3,0][t]*S[1,0,-1][t]-2*koff*S[1,0,0][t]-kpoff*S[1,0,0][t]-k1a*RAFK[t]*S[1,0,0][t]+d1a*S_RAFK[1,0,0][t]
S[1,0,1]	0	(S[1,0,1])'[t]==kpon*K[1,1][t]*S[-1,0,1][t]+kon*K[2,0][t]*S[1,-1,1][t]+kpon*K[3,1][t]*S[1,0,-1][t]-k3*S[1,0,1][t]-koff*S[1,0,1][t]-2*kpoff*S[1,0,1][t]+k1*S_RAFK[1,0,0][t]

S[1,1,-1]	0	(S[1,1,-1])'[t]==kpon*K[1,1][t]*S[-1,1,-1][t]+kpon*K[2,1][t]*S[1,-1,-1][t]-2*kpoff*S[1,1,-1][t]-kon*K[3,0][t]*S[1,1,-1][t]-kpon*K[3,1][t]*S[1,1,-1][t]+koff*S[1,1,0][t]+kpoff*S[1,1,1][t]
S[1,1,0]	0	(S[1,1,0])'[t]==kpon*K[1,1][t]*S[-1,1,0][t]+kpon*K[2,1][t]*S[1,-1,0][t]+kon*K[3,0][t]*S[1,1,-1][t]-koff*S[1,1,0][t]-2*kpoff*S[1,1,0][t]-k1a*RAFK[t]*S[1,1,0][t]+d1a*S_RAFK[1,1,0][t]
S[1,1,1]	0	(S[1,1,1])'[t]==kpon*K[1,1][t]*S[-1,1,1][t]+kpon*K[2,1][t]*S[1,-1,1][t]+k3*S[1,0,1][t]+kpon*K[3,1][t]*S[1,1,-1][t]-k5a*S[1,1,1][t]-3*kpoff*S[1,1,1][t]+k1*S_RAFK[1,1,0][t]
S[1,2,-1]	0	(S[1,2,-1])'[t]==kpon*K[1,1][t]*S[-1,2,-1][t]+k7*S[0,2,-1][t]+kpon*K[2,2][t]*S[1,-1,-1][t]-k9a*S[1,2,-1][t]-2*kpoff*S[1,2,-1][t]-kon*K[3,0][t]*S[1,2,-1][t]-kpon*K[3,1][t]*S[1,2,-1][t]+koff*S[1,2,0][t]+kpoff*S[1,2,1][t]
S[1,2,0]	0	(S[1,2,0])'[t]==kpon*K[1,1][t]*S[-1,2,0][t]+k7*S[0,2,0][t]+kpon*K[2,2][t]*S[1,-1,0][t]+kon*K[3,0][t]*S[1,2,-1][t]-k9a*S[1,2,0][t]-koff*S[1,2,0][t]-2*kpoff*S[1,2,0][t]-k1a*RAFK[t]*S[1,2,0][t]+d1a*S_RAFK[1,2,0][t]
S[1,2,1]	0	(S[1,2,1])'[t]==kpon*K[1,1][t]*S[-1,2,1][t]+k7*S[0,2,1][t]+kpon*K[2,2][t]*S[1,-1,1][t]+k5a*S[1,1,1][t]+kpon*K[3,1][t]*S[1,2,-1][t]-k9a*S[1,2,1][t]-3*kpoff*S[1,2,1][t]+k1*S_RAFK[1,2,0][t]

S[2,-1,-1]	0	(S[2,-1,-1])'[t]==kpon*K[1,2][t]*S[-1,-1,-1][t]-kpoff*S[2,-1,-1][t]-kon*K[2,0][t]*S[2,-1,-1][t]-kpon*K[2,1][t]*S[2,-1,-1][t]-kpon*K[2,2][t]*S[2,-1,-1][t]-kon*K[3,0][t]*S[2,-1,-1][t]-kpon*K[3,1][t]*S[2,-1,-1][t]+koff*S[2,-1,0][t]+kpoff*S[2,-1,1][t]+koff*S[2,0,-1][t]+kpoff*S[2,1,-1][t]+kpoff*S[2,2,-1][t]
S[2,-1,0]	0	(S[2,-1,0])'[t]==kpon*K[1,2][t]*S[-1,-1,0][t]+kon*K[3,0][t]*S[2,-1,-1][t]-koff*S[2,-1,0][t]-kpoff*S[2,-1,0][t]-k1a*RAFK[t]*S[2,-1,0][t]-kon*K[2,0][t]*S[2,-1,0][t]-kpon*K[2,1][t]*S[2,-1,0][t]-kpon*K[2,2][t]*S[2,-1,0][t]+koff*S[2,0,0][t]+kpoff*S[2,1,0][t]+kpoff*S[2,1,0][t]
S[2,-1,1]	0	(S[2,-1,1])'[t]==kpon*K[1,2][t]*S[-1,-1,1][t]+kpon*K[3,1][t]*S[2,-1,-1][t]-2*kpoff*S[2,-1,1][t]-kon*K[2,0][t]*S[2,-1,1][t]-kpon*K[2,1][t]*S[2,-1,1][t]-kpon*K[2,2][t]*S[2,-1,1][t]+koff*S[2,0,1][t]+kpoff*S[2,1,1][t]+kpoff*S[2,1,0][t]

S[2,0,-1]	0	(S[2,0,-1])'[t]==kpon*K[1,2][t]*S[-1,0,-1][t]+kon*K[2,0][t]*S[2,-1,-1][t]-koff*S[2,0,-1][t]-kpoff*S[2,0,-1][t]-kon*K[3,0][t]*S[2,0,-1][t]-kpon*K[3,1][t]*S[2,0,-1][t]+koff*S[2,0,0][t]+kpoff*S[2,0,1][t]
S[2,0,0]	0	(S[2,0,0])'[t]==kpon*K[1,2][t]*S[-1,0,0][t]+kon*K[2,0][t]*S[2,-1,0][t]+kon*K[3,0][t]*S[2,0,-1][t]-2*koff*S[2,0,0][t]-kpoff*S[2,0,0][t]-k1a*RAFK[t]*S[2,0,0][t]+d1a*S_RAFK[2,0,0][t]
S[2,0,1]	0	(S[2,0,1])'[t]==kpon*K[1,2][t]*S[-1,0,1][t]+kon*K[2,0][t]*S[2,-1,1][t]+kpon*K[3,1][t]*S[2,0,-1][t]-k3*S[2,0,1][t]-koff*S[2,0,1][t]-2*kpoff*S[2,0,1][t]+k1*S_RAFK[2,0,0][t]
S[2,1,-1]	0	(S[2,1,-1])'[t]==kpon*K[1,2][t]*S[-1,1,-1][t]+kpon*K[2,1][t]*S[2,-1,-1][t]-2*kpoff*S[2,1,-1][t]-kon*K[3,0][t]*S[2,1,-1][t]-kpon*K[3,1][t]*S[2,1,-1][t]+koff*S[2,1,0][t]+kpoff*S[2,1,1][t]
S[2,1,0]	0	(S[2,1,0])'[t]==kpon*K[1,2][t]*S[-1,1,0][t]+kpon*K[2,1][t]*S[2,-1,0][t]+kon*K[3,0][t]*S[2,1,-1][t]-koff*S[2,1,0][t]-2*kpoff*S[2,1,0][t]-k1a*RAFK[t]*S[2,1,0][t]+d1a*S_RAFK[2,1,0][t]
S[2,1,1]	0	(S[2,1,1])'[t]==kpon*K[1,2][t]*S[-1,1,1][t]+kpon*K[2,1][t]*S[2,-1,1][t]+k3*S[2,0,1][t]+kpon*K[3,1][t]*S[2,1,-1][t]-k5a*S[2,1,1][t]-3*kpoff*S[2,1,1][t]+k1*S_RAFK[2,1,0][t]

S[2,2,-1]	0	(S[2,2,-1])'[t]==kpon*K[1,2][t]*S[-1,2,-1][t]+k9a*S[1,2,-1][t]+kpon*K[2,2][t]*S[2,-1,-1][t]-2*kpoff*S[2,2,-1][t]-kon*K[3,0][t]*S[2,2,-1][t]-kpon*K[3,1][t]*S[2,2,-1][t]+koff*S[2,2,0][t]+kpoff*S[2,2,1][t]
S[2,2,0]	0	(S[2,2,0])'[t]==kpon*K[1,2][t]*S[-1,2,0][t]+k9a*S[1,2,0][t]+kpon*K[2,2][t]*S[2,-1,0][t]+kon*K[3,0][t]*S[2,2,-1][t]-koff*S[2,2,0][t]-2*kpoff*S[2,2,0][t]-k1a*RAFK[t]*S[2,2,0][t]+d1a*S_RAFK[2,2,0][t]
S[2,2,1]	0	(S[2,2,1])'[t]==kpon*K[1,2][t]*S[-1,2,1][t]+k9a*S[1,2,1][t]+kpon*K[2,2][t]*S[2,-1,1][t]+k5a*S[2,1,1][t]+kpon*K[3,1][t]*S[2,2,-1][t]-3*kpoff*S[2,2,1][t]+k1*S_RAFK[2,2,0][t]
S_RAFK[-1,-1,0]	0	(S_RAFK[-1,-1,0])'[t]==k1a*RAFK[t]*S[-1,-1,0][t]-d1a*S_RAFK[-1,-1,0][t]-k1*S_RAFK[-1,-1,0][t]
S_RAFK[-1,0,0]	0	(S_RAFK[-1,0,0])'[t]==k1a*RAFK[t]*S[-1,0,0][t]-d1a*S_RAFK[-1,0,0][t]-k1*S_RAFK[-1,0,0][t]
S_RAFK[-1,1,0]	0	(S_RAFK[-1,1,0])'[t]==k1a*RAFK[t]*S[-1,1,0][t]-d1a*S_RAFK[-1,1,0][t]-k1*S_RAFK[-1,1,0][t]
S_RAFK[-1,2,0]	0	(S_RAFK[-1,2,0])'[t]==k1a*RAFK[t]*S[-1,2,0][t]-d1a*S_RAFK[-1,2,0][t]-k1*S_RAFK[-1,2,0][t]

S_RAFK[0,-1,0]	0	(S_RAFK[0,-1,0])'[t]==k1a*RAFK[t]*S[0,-1,0][t]-d1a*S_RAFK[0,-1,0][t]-k1*S_RAFK[0,-1,0][t]
S_RAFK[0,0,0]	0	(S_RAFK[0,0,0])'[t]==k1a*RAFK[t]*S[0,0,0][t]-d1a*S_RAFK[0,0,0][t]-k1*S_RAFK[0,0,0][t]
S_RAFK[0,1,0]	0	(S_RAFK[0,1,0])'[t]==k1a*RAFK[t]*S[0,1,0][t]-d1a*S_RAFK[0,1,0][t]-k1*S_RAFK[0,1,0][t]
S_RAFK[0,2,0]	0	(S_RAFK[0,2,0])'[t]==k1a*RAFK[t]*S[0,2,0][t]-d1a*S_RAFK[0,2,0][t]-k1*S_RAFK[0,2,0][t]
S_RAFK[1,-1,0]	0	(S_RAFK[1,-1,0])'[t]==k1a*RAFK[t]*S[1,-1,0][t]-d1a*S_RAFK[1,-1,0][t]-k1*S_RAFK[1,-1,0][t]
S_RAFK[1,0,0]	0	(S_RAFK[1,0,0])'[t]==k1a*RAFK[t]*S[1,0,0][t]-d1a*S_RAFK[1,0,0][t]-k1*S_RAFK[1,0,0][t]
S_RAFK[1,1,0]	0	(S_RAFK[1,1,0])'[t]==k1a*RAFK[t]*S[1,1,0][t]-d1a*S_RAFK[1,1,0][t]-k1*S_RAFK[1,1,0][t]
S_RAFK[1,2,0]	0	(S_RAFK[1,2,0])'[t]==k1a*RAFK[t]*S[1,2,0][t]-d1a*S_RAFK[1,2,0][t]-k1*S_RAFK[1,2,0][t]
S_RAFK[2,-1,0]	0	(S_RAFK[2,-1,0])'[t]==k1a*RAFK[t]*S[2,-1,0][t]-d1a*S_RAFK[2,-1,0][t]-k1*S_RAFK[2,-1,0][t]
S_RAFK[2,0,0]	0	(S_RAFK[2,0,0])'[t]==k1a*RAFK[t]*S[2,0,0][t]-d1a*S_RAFK[2,0,0][t]-k1*S_RAFK[2,0,0][t]
S_RAFK[2,1,0]	0	(S_RAFK[2,1,0])'[t]==k1a*RAFK[t]*S[2,1,0][t]-d1a*S_RAFK[2,1,0][t]-k1*S_RAFK[2,1,0][t]
S_RAFK[2,2,0]	0	(S_RAFK[2,2,0])'[t]==k1a*RAFK[t]*S[2,2,0][t]-d1a*S_RAFK[2,2,0][t]-k1*S_RAFK[2,2,0][t]

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author=B.E.Shapiro

2 Unit Definitions

This is an overview of five unit definitions which are all predefined by SBML and not mentioned
in the model.

2.1 Unit `substance`

Notes Mole is the predefined SBML unit for `substance`.

Definition mol

2.2 Unit `volume`

Notes Litre is the predefined SBML unit for `volume`.

Definition l

2.3 Unit `area`

Notes Square metre is the predefined SBML unit for `area` since SBML Level 2 Version 1.

Definition m^2

2.4 Unit `length`

Notes Metre is the predefined SBML unit for `length` since SBML Level 2 Version 1.

Definition m

2.5 Unit `time`

Notes Second is the predefined SBML unit for `time`.

Definition s

3 Compartment

This model contains one compartment.

Table 6: Properties of all compartments.

Id	Name	SBO	Spatial Dimensions	Size	Unit	Constant	Outside
Cytoplasm			3	1	litre	☑	

3.1 Compartment `Cytoplasm`

This is a three dimensional compartment with a constant size of one litre.

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4 Species

This model contains 86 species. Section 6 provides further details and the derived rates of change of each species.

Table 7: Properties of each species.

Id	Name	Compartment	Derived Unit	Constant	Boundary Condition
MAPKP	MAPK phosphatase	Cytoplasm	mol	⊟	⊟
MEKP	MEK phosphatase	Cytoplasm	mol	⊟	⊟
RAFK	RAF kinase	Cytoplasm	mol	⊟	⊟
RAFP	RAF phosphatase	Cytoplasm	mol	⊟	⊟
K_1_0	MAPK	Cytoplasm	mol	⊟	⊟
K_1_1	MAPK-P	Cytoplasm	mol	⊟	⊟
K_1_2	MAPK-PP	Cytoplasm	mol	⊟	⊟
K_2_0	MEK	Cytoplasm	mol	⊟	⊟
K_2_1	MEK-P	Cytoplasm	mol	⊟	⊟
K_2_2	MEK-PP	Cytoplasm	mol	⊟	⊟
K_3_0	RAF	Cytoplasm	mol	⊟	⊟
K_3_1	RAF-P	Cytoplasm	mol	⊟	⊟
K_K_1_0_2_2	MAPK_MEK-PP	Cytoplasm	mol	⊟	⊟
K_K_1_1_2_2	MAPK-P_MEK-PP	Cytoplasm	mol	⊟	⊟
K_K_2_0_3_1	MEK_RAF-P	Cytoplasm	mol	⊟	⊟
K_K_2_1_3_1	MEK-P_RAF-P	Cytoplasm	mol	⊟	⊟
K_MAPKP_1_1	MAPK-P_MAPKPase	Cytoplasm	mol	⊟	⊟
K_MAPKP_1_2	MAPK-PP_MAPKPase	Cytoplasm	mol	⊟	⊟
K_MEKP_2_1	MEK-P_MEKPase	Cytoplasm	mol	⊟	⊟
K_MEKP_2_2	MEK-PP_MEKPase	Cytoplasm	mol	⊟	⊟
K_RAFK_3_0	RAF_RAFK	Cytoplasm	mol	⊟	⊟
K_RAFP_3_1	RAF-P_RAFPase	Cytoplasm	mol	⊟	⊟

Id	Name	Compartment	Derived Unit	Constant	Boundary Condi- tion
S_m1_m1_m1	Scaffold	Cytoplasm	mol	⊟	⊟
S_m1_m1_0	Scaffold_RAF	Cytoplasm	mol	⊟	⊟
S_m1_m1_1	Scaffold_RAF-P	Cytoplasm	mol	⊟	⊟
S_m1_0_m1	Scaffold_MEK	Cytoplasm	mol	⊟	⊟
S_m1_0_0	Scaffold_MEK_RAF	Cytoplasm	mol	⊟	⊟
S_m1_0_1	Scaffold_MEK_RAF-P	Cytoplasm	mol	⊟	⊟
S_m1_1_m1	Scaffold_MEK-P	Cytoplasm	mol	⊟	⊟
S_m1_1_0	Scaffold_MEK-P_RAF	Cytoplasm	mol	⊟	⊟
S_m1_1_1	Scaffold_MEK-P_RAF-P	Cytoplasm	mol	⊟	⊟
S_m1_2_m1	Scaffold_MEK-PP	Cytoplasm	mol	⊟	⊟
S_m1_2_0	Scaffold_MEK-PP_RAF	Cytoplasm	mol	⊟	⊟
S_m1_2_1	Scaffold_MEK-PP_RAF-P	Cytoplasm	mol	⊟	⊟
S_0_m1_m1	Scaffold_MAPK	Cytoplasm	mol	⊟	⊟
S_0_m1_0	Scaffold_MAPK_RAF	Cytoplasm	mol	⊟	⊟
S_0_m1_1	Scaffold_MAPK_RAF-P	Cytoplasm	mol	⊟	⊟
S_0_0_m1	Scaffold_MAPK_MEK	Cytoplasm	mol	⊟	⊟
S_0_0_0	Scaffold_MAPK_MEK_RAF	Cytoplasm	mol	⊟	⊟
S_0_0_1	Scaffold_MAPK_MEK_RAF-P	Cytoplasm	mol	⊟	⊟
S_0_1_m1	Scaffold_MAPK_MEK-P	Cytoplasm	mol	⊟	⊟
S_0_1_0	Scaffold_MAPK_MEK-P_RAF	Cytoplasm	mol	⊟	⊟
S_0_1_1	Scaffold_MAPK_MEK-P_RAF-P	Cytoplasm	mol	⊟	⊟
S_0_2_m1	Scaffold_MAPK_MEK-PP	Cytoplasm	mol	⊟	⊟
S_0_2_0	Scaffold_MAPK_MEK-PP_RAF	Cytoplasm	mol	⊟	⊟
S_0_2_1	Scaffold_MAPK_MEK-PP_RAF-P	Cytoplasm	mol	⊟	⊟
S_1_m1_m1	Scaffold_MAPK-P	Cytoplasm	mol	⊟	⊟
S_1_m1_0	Scaffold_MAPK-P_RAF	Cytoplasm	mol	⊟	⊟
S_1_m1_1	Scaffold_MAPK-P_RAF-P	Cytoplasm	mol	⊟	⊟

Id	Name	Compartment	Derived Unit	Constant	Boundary Condition
S_1_0_m1	Scaffold_MAPK-P_MEK	Cytoplasm	mol	⊟	⊟
S_1_0_0	Scaffold_MAPK-P_MEK_RAF	Cytoplasm	mol	⊟	⊟
S_1_0_1	Scaffold_MAPK-P_MEK_RAF-P	Cytoplasm	mol	⊟	⊟
S_1_1_m1	Scaffold_MAPK-P_MEK-P	Cytoplasm	mol	⊟	⊟
S_1_1_0	Scaffold_MAPK-P_MEK-P_RAF	Cytoplasm	mol	⊟	⊟
S_1_1_1	Scaffold_MAPK-P_MEK-P_RAF-P	Cytoplasm	mol	⊟	⊟
S_1_2_m1	Scaffold_MAPK-P_MEK-PP	Cytoplasm	mol	⊟	⊟
S_1_2_0	Scaffold_MAPK-P_MEK-PP_RAF	Cytoplasm	mol	⊟	⊟
S_1_2_1	Scaffold_MAPK-P_MEK-PP_RAF-P	Cytoplasm	mol	⊟	⊟
S_2_m1_m1	Scaffold_MAPK-PP	Cytoplasm	mol	⊟	⊟
S_2_m1_0	Scaffold_MAPK-PP_RAF	Cytoplasm	mol	⊟	⊟
S_2_m1_1	Scaffold_MAPK-PP_RAF-P	Cytoplasm	mol	⊟	⊟
S_2_0_m1	Scaffold_MAPK-PP_MEK	Cytoplasm	mol	⊟	⊟
S_2_0_0	Scaffold_MAPK-PP_MEK_RAF	Cytoplasm	mol	⊟	⊟
S_2_0_1	Scaffold_MAPK-PP_MEK_RAF-P	Cytoplasm	mol	⊟	⊟
S_2_1_m1	Scaffold_MAPK-PP_MEK-P	Cytoplasm	mol	⊟	⊟
S_2_1_0	Scaffold_MAPK-PP_MEK-P_RAF	Cytoplasm	mol	⊟	⊟
S_2_1_1	Scaffold_MAPK-PP_MEK-P_RAF-P	Cytoplasm	mol	⊟	⊟
S_2_2_m1	Scaffold_MAPK-PP_MEK-PP	Cytoplasm	mol	⊟	⊟
S_2_2_0	Scaffold_MAPK-PP_MEK-PP_RAF	Cytoplasm	mol	⊟	⊟
S_2_2_1	Scaffold_MAPK-PP_MEK-PP_RAF-P	Cytoplasm	mol	⊟	⊟
S_RAFK_m1_m1_0	Scaffold_RAF	Cytoplasm	mol	⊟	⊟
S_RAFK_m1_0_0	Scaffold_MEK_RAF	Cytoplasm	mol	⊟	⊟
S_RAFK_m1_1_0	Scaffold_MEK-P_RAF	Cytoplasm	mol	⊟	⊟
S_RAFK_m1_2_0	Scaffold_MEK-PP_RAF	Cytoplasm	mol	⊟	⊟
S_RAFK_0_m1_0	Scaffold_MAPK_RAF	Cytoplasm	mol	⊟	⊟
S_RAFK_0_0_0	Scaffold_MAPK_MEK_RAF	Cytoplasm	mol	⊟	⊟

Id	Name	Compartment	Derived Unit	Constant	Boundary Condi-tion
S_RAFK_0_1_0	Scaffold_MAPK_MEK-P_RAF	Cytoplasm	mol	⊟	⊟
S_RAFK_0_2_0	Scaffold_MAPK_MEK-PP_RAF	Cytoplasm	mol	⊟	⊟
S_RAFK_1_m1_0	Scaffold_MAPK-P_RAF	Cytoplasm	mol	⊟	⊟
S_RAFK_1_0_0	Scaffold_MAPK-P_MEK_RAF	Cytoplasm	mol	⊟	⊟
S_RAFK_1_1_0	Scaffold_MAPK-P_MEK-P_RAF	Cytoplasm	mol	⊟	⊟
S_RAFK_1_2_0	Scaffold_MAPK-P_MEK-PP_RAF	Cytoplasm	mol	⊟	⊟
S_RAFK_2_m1_0	Scaffold_MAPK-PP_RAF	Cytoplasm	mol	⊟	⊟
S_RAFK_2_0_0	Scaffold_MAPK-PP_MEK_RAF	Cytoplasm	mol	⊟	⊟
S_RAFK_2_1_0	Scaffold_MAPK-PP_MEK-P_RAF	Cytoplasm	mol	⊟	⊟
S_RAFK_2_2_0	Scaffold_MAPK-PP_MEK-PP_RAF	Cytoplasm	mol	⊟	⊟

5 Reactions

This model contains 300 reactions. All reactions are listed in the following table and are subsequently described in detail. If a reaction is affected by a modifier, the identifier of this species is written above the reaction arrow.

Table 8: Overview of all reactions

№	Id	Name	Reaction Equation	SBO
1	Reaction1	binding of RAF and RAFK	$RAFK + K\_3\_0 \longrightarrow K\_RAFK\_3\_0$	
2	Reaction2	dissociation of RAF_RAFK	$K\_RAFK\_3\_0 \longrightarrow RAFK + K\_3\_0$	
3	Reaction3	phosphorylation of RAF	$K\_RAFK\_3\_0 \longrightarrow RAFK + K\_3\_1$	
4	Reaction4	binding of RAF-P and RAF phosphatase	$RAFP + K\_3\_1 \longrightarrow K\_RAFP\_3\_1$	
5	Reaction5	dissociation of RAF-P_RAFPase	$K\_RAFP\_3\_1 \longrightarrow RAFP + K\_3\_1$	
6	Reaction6	dephosphorylation of RAF-P	$K\_RAFP\_3\_1 \longrightarrow RAFP + K\_3\_0$	
7	Reaction7	binding of MEK and RAF-P	$K\_2\_0 + K\_3\_1 \longrightarrow K\_K\_2\_0\_3\_1$	
8	Reaction8	dissociation of MEK_RAF-P	$K\_K\_2\_0\_3\_1 \longrightarrow K\_2\_0 + K\_3\_1$	
9	Reaction9	phosphorylation of MEK	$K\_K\_2\_0\_3\_1 \longrightarrow K\_2\_1 + K\_3\_1$	
10	Reaction10	binding of MEK-P and MEK phosphatase	$MEKP + K\_2\_1 \longrightarrow K\_MEKP\_2\_1$	
11	Reaction11	dissociation of MEK-P_MEKPase	$K\_MEKP\_2\_1 \longrightarrow MEKP + K\_2\_1$	
12	Reaction12	dephosphorylation of MEK-P	$K\_MEKP\_2\_1 \longrightarrow MEKP + K\_2\_0$	
13	Reaction13	binding of MEK-P and RAF-P	$K\_2\_1 + K\_3\_1 \longrightarrow K\_K\_2\_1\_3\_1$	
14	Reaction14	dissociation of MEK-P_RAF-P	$K\_K\_2\_1\_3\_1 \longrightarrow K\_2\_1 + K\_3\_1$	
15	Reaction15	phosphorylation of MEK-P	$K\_K\_2\_1\_3\_1 \longrightarrow K\_2\_2 + K\_3\_1$	
16	Reaction16	binding of MEK-PP and MEK phosphatase	$MEKP + K\_2\_2 \longrightarrow K\_MEKP\_2\_2$	
17	Reaction17	dissociation of MEK-PP_MEKPase	$K\_MEKP\_2\_2 \longrightarrow MEKP + K\_2\_2$	
18	Reaction18	dephosphorylation of MEK-PP	$K\_MEKP\_2\_2 \longrightarrow MEKP + K\_2\_1$	
19	Reaction19	binding of MAPK and MEK-PP	$K\_1\_0 + K\_2\_2 \longrightarrow K\_K\_1\_0\_2\_2$	
20	Reaction20	dissociation of MAPK_MEK-PP	$K\_K\_1\_0\_2\_2 \longrightarrow K\_1\_0 + K\_2\_2$	
21	Reaction21	phosphorylation of MAPK	$K\_K\_1\_0\_2\_2 \longrightarrow K\_1\_1 + K\_2\_2$	
22	Reaction22	binding of MAPK-P and MAPK phosphatase	$MAPKP + K\_1\_1 \longrightarrow K\_MAPKP\_1\_1$	
23	Reaction23	dissociation of MAPK-P_MAPKPase	$K\_MAPKP\_1\_1 \longrightarrow MAPKP + K\_1\_1$	

№	Id	Name	Reaction Equation	SBO
24	Reaction24	dephosphorylation of MAPK-P	$K\_MAPKP\_1\_1 \longrightarrow MAPKP + K\_1\_0$	
25	Reaction25	binding of MAPK-P and MEK-PP	$K\_1\_1 + K\_2\_2 \longrightarrow K\_K\_1\_1\_2\_2$	
26	Reaction26	dissociation of MAPK-P_MEK-PP	$K\_K\_1\_1\_2\_2 \longrightarrow K\_1\_1 + K\_2\_2$	
27	Reaction27	phosphorylation of MAPK-P	$K\_K\_1\_1\_2\_2 \longrightarrow K\_1\_2 + K\_2\_2$	
28	Reaction28	binding of MAPK-PP and MAPK phosphatase	$MAPKP + K\_1\_2 \longrightarrow K\_MAPKP\_1\_2$	
29	Reaction29	dissociation of MAPK-PP_MAPKPase	$K\_MAPKP\_1\_2 \longrightarrow MAPKP + K\_1\_2$	
30	Reaction30	dephosphorylation of MAPK-PP	$K\_MAPKP\_1\_2 \longrightarrow MAPKP + K\_1\_1$	
31	Reaction31	binding of MAPK on scaffold	$K\_1\_0 + S\_m1\_m1\_m1 \longrightarrow S\_0\_m1\_m1$	
32	Reaction32	dissociation of MAPK from scaffold	$S\_0\_m1\_m1 \longrightarrow K\_1\_0 + S\_m1\_m1\_m1$	
33	Reaction33	binding of MAPK on scaffold	$K\_1\_0 + S\_m1\_m1\_0 \longrightarrow S\_0\_m1\_0$	
34	Reaction34	dissociation of MAPK from scaffold	$S\_0\_m1\_0 \longrightarrow K\_1\_0 + S\_m1\_m1\_0$	
35	Reaction35	binding of MAPK on scaffold	$K\_1\_0 + S\_m1\_m1\_1 \longrightarrow S\_0\_m1\_1$	
36	Reaction36	dissociation of MAPK from scaffold	$S\_0\_m1\_1 \longrightarrow K\_1\_0 + S\_m1\_m1\_1$	
37	Reaction37	binding of MAPK on scaffold	$K\_1\_0 + S\_m1\_0\_m1 \longrightarrow S\_0\_0\_m1$	
38	Reaction38	dissociation of MAPK from scaffold	$S\_0\_0\_m1 \longrightarrow K\_1\_0 + S\_m1\_0\_m1$	
39	Reaction39	binding of MAPK on scaffold	$K\_1\_0 + S\_m1\_0\_0 \longrightarrow S\_0\_0\_0$	
40	Reaction40	dissociation of MAPK from scaffold	$S\_0\_0\_0 \longrightarrow K\_1\_0 + S\_m1\_0\_0$	
41	Reaction41	binding of MAPK on scaffold	$K\_1\_0 + S\_m1\_0\_1 \longrightarrow S\_0\_0\_1$	
42	Reaction42	dissociation of MAPK from scaffold	$S\_0\_0\_1 \longrightarrow K\_1\_0 + S\_m1\_0\_1$	
43	Reaction43	binding of MAPK on scaffold	$K\_1\_0 + S\_m1\_1\_m1 \longrightarrow S\_0\_1\_m1$	
44	Reaction44	dissociation of MAPK from scaffold	$S\_0\_1\_m1 \longrightarrow K\_1\_0 + S\_m1\_1\_m1$	
45	Reaction45	binding of MAPK on scaffold	$K\_1\_0 + S\_m1\_1\_0 \longrightarrow S\_0\_1\_0$	
46	Reaction46	dissociation of MAPK from scaffold	$S\_0\_1\_0 \longrightarrow K\_1\_0 + S\_m1\_1\_0$	
47	Reaction47	binding of MAPK on scaffold	$K\_1\_0 + S\_m1\_1\_1 \longrightarrow S\_0\_1\_1$	
48	Reaction48	dissociation of MAPK from scaffold	$S\_0\_1\_1 \longrightarrow K\_1\_0 + S\_m1\_1\_1$	
49	Reaction49	binding of MAPK on scaffold	$K\_1\_0 + S\_m1\_2\_m1 \longrightarrow S\_0\_2\_m1$	
50	Reaction50	dissociation of MAPK from scaffold	$S\_0\_2\_m1 \longrightarrow K\_1\_0 + S\_m1\_2\_m1$	
51	Reaction51	binding of MAPK on scaffold	$K\_1\_0 + S\_m1\_2\_0 \longrightarrow S\_0\_2\_0$	

№	Id	Name	Reaction Equation	SBO
52	Reaction52	dissociation of MAPK from scaffold	$S\_0\_2\_0 \longrightarrow K\_1\_0 + S\_m1\_2\_0$	
53	Reaction53	binding of MAPK on scaffold	$K\_1\_0 + S\_m1\_2\_1 \longrightarrow S\_0\_2\_1$	
54	Reaction54	dissociation of MAPK from scaffold	$S\_0\_2\_1 \longrightarrow K\_1\_0 + S\_m1\_2\_1$	
55	Reaction55	binding of MAPK-P on scaffold	$K\_1\_1 + S\_m1\_m1\_m1 \longrightarrow S\_1\_m1\_m1$	
56	Reaction56	dissociation of MAPK-P from scaffold	$S\_1\_m1\_m1 \longrightarrow K\_1\_1 + S\_m1\_m1\_m1$	
57	Reaction57	binding of MAPK-P on scaffold	$K\_1\_1 + S\_m1\_m1\_0 \longrightarrow S\_1\_m1\_0$	
58	Reaction58	dissociation of MAPK-P from scaffold	$S\_1\_m1\_0 \longrightarrow K\_1\_1 + S\_m1\_m1\_0$	
59	Reaction59	binding of MAPK-P on scaffold	$K\_1\_1 + S\_m1\_m1\_1 \longrightarrow S\_1\_m1\_1$	
60	Reaction60	dissociation of MAPK-P from scaffold	$S\_1\_m1\_1 \longrightarrow K\_1\_1 + S\_m1\_m1\_1$	
61	Reaction61	binding of MAPK-P on scaffold	$K\_1\_1 + S\_m1\_0\_m1 \longrightarrow S\_1\_0\_m1$	
62	Reaction62	dissociation of MAPK-P from scaffold	$S\_1\_0\_m1 \longrightarrow K\_1\_1 + S\_m1\_0\_m1$	
63	Reaction63	binding of MAPK-P on scaffold	$K\_1\_1 + S\_m1\_0\_0 \longrightarrow S\_1\_0\_0$	
64	Reaction64	dissociation of MAPK-P from scaffold	$S\_1\_0\_0 \longrightarrow K\_1\_1 + S\_m1\_0\_0$	
65	Reaction65	binding of MAPK-P on scaffold	$K\_1\_1 + S\_m1\_0\_1 \longrightarrow S\_1\_0\_1$	
66	Reaction66	dissociation of MAPK-P from scaffold	$S\_1\_0\_1 \longrightarrow K\_1\_1 + S\_m1\_0\_1$	
67	Reaction67	binding of MAPK-P on scaffold	$K\_1\_1 + S\_m1\_1\_m1 \longrightarrow S\_1\_1\_m1$	
68	Reaction68	dissociation of MAPK-P from scaffold	$S\_1\_1\_m1 \longrightarrow K\_1\_1 + S\_m1\_1\_m1$	
69	Reaction69	binding of MAPK-P on scaffold	$K\_1\_1 + S\_m1\_1\_0 \longrightarrow S\_1\_1\_0$	
70	Reaction70	dissociation of MAPK-P from scaffold	$S\_1\_1\_0 \longrightarrow K\_1\_1 + S\_m1\_1\_0$	
71	Reaction71	binding of MAPK-P on scaffold	$K\_1\_1 + S\_m1\_1\_1 \longrightarrow S\_1\_1\_1$	
72	Reaction72	dissociation of MAPK-P from scaffold	$S\_1\_1\_1 \longrightarrow K\_1\_1 + S\_m1\_1\_1$	
73	Reaction73	binding of MAPK-P on scaffold	$K\_1\_1 + S\_m1\_2\_m1 \longrightarrow S\_1\_2\_m1$	
74	Reaction74	dissociation of MAPK-P from scaffold	$S\_1\_2\_m1 \longrightarrow K\_1\_1 + S\_m1\_2\_m1$	
75	Reaction75	binding of MAPK-P on scaffold	$K\_1\_1 + S\_m1\_2\_0 \longrightarrow S\_1\_2\_0$	
76	Reaction76	dissociation of MAPK-P from scaffold	$S\_1\_2\_0 \longrightarrow K\_1\_1 + S\_m1\_2\_0$	
77	Reaction77	binding of MAPK-P on scaffold	$K\_1\_1 + S\_m1\_2\_1 \longrightarrow S\_1\_2\_1$	
78	Reaction78	dissociation of MAPK-P from scaffold	$S\_1\_2\_1 \longrightarrow K\_1\_1 + S\_m1\_2\_1$	
79	Reaction79	binding of MAPK-PP on scaffold	$K\_1\_2 + S\_m1\_m1\_m1 \longrightarrow S\_2\_m1\_m1$	
80	Reaction80	dissociation of MAPK-PP from scaffold	$S\_2\_m1\_m1 \longrightarrow K\_1\_2 + S\_m1\_m1\_m1$	

№	Id	Name	Reaction Equation	SBO
81	Reaction81	binding of MAPK-PP on scaffold	$K\_1\_2 + S\_m1\_m1\_0 \longrightarrow S\_2\_m1\_0$	
82	Reaction82	dissociation of MAPK-PP from scaffold	$S\_2\_m1\_0 \longrightarrow K\_1\_2 + S\_m1\_m1\_0$	
83	Reaction83	binding of MAPK-PP on scaffold	$K\_1\_2 + S\_m1\_m1\_1 \longrightarrow S\_2\_m1\_1$	
84	Reaction84	dissociation of MAPK-PP from scaffold	$S\_2\_m1\_1 \longrightarrow K\_1\_2 + S\_m1\_m1\_1$	
85	Reaction85	binding of MAPK-PP on scaffold	$K\_1\_2 + S\_m1\_0\_m1 \longrightarrow S\_2\_0\_m1$	
86	Reaction86	dissociation of MAPK-PP from scaffold	$S\_2\_0\_m1 \longrightarrow K\_1\_2 + S\_m1\_0\_m1$	
87	Reaction87	binding of MAPK-PP on scaffold	$K\_1\_2 + S\_m1\_0\_0 \longrightarrow S\_2\_0\_0$	
88	Reaction88	dissociation of MAPK-PP from scaffold	$S\_2\_0\_0 \longrightarrow K\_1\_2 + S\_m1\_0\_0$	
89	Reaction89	binding of MAPK-PP on scaffold	$K\_1\_2 + S\_m1\_0\_1 \longrightarrow S\_2\_0\_1$	
90	Reaction90	dissociation of MAPK-PP from scaffold	$S\_2\_0\_1 \longrightarrow K\_1\_2 + S\_m1\_0\_1$	
91	Reaction91	binding of MAPK-PP on scaffold	$K\_1\_2 + S\_m1\_1\_m1 \longrightarrow S\_2\_1\_m1$	
92	Reaction92	dissociation of MAPK-PP from scaffold	$S\_2\_1\_m1 \longrightarrow K\_1\_2 + S\_m1\_1\_m1$	
93	Reaction93	binding of MAPK-PP on scaffold	$K\_1\_2 + S\_m1\_1\_0 \longrightarrow S\_2\_1\_0$	
94	Reaction94	dissociation of MAPK-PP from scaffold	$S\_2\_1\_0 \longrightarrow K\_1\_2 + S\_m1\_1\_0$	
95	Reaction95	binding of MAPK-PP on scaffold	$K\_1\_2 + S\_m1\_1\_1 \longrightarrow S\_2\_1\_1$	
96	Reaction96	dissociation of MAPK-PP from scaffold	$S\_2\_1\_1 \longrightarrow K\_1\_2 + S\_m1\_1\_1$	
97	Reaction97	binding of MAPK-PP on scaffold	$K\_1\_2 + S\_m1\_2\_m1 \longrightarrow S\_2\_2\_m1$	
98	Reaction98	dissociation of MAPK-PP from scaffold	$S\_2\_2\_m1 \longrightarrow K\_1\_2 + S\_m1\_2\_m1$	
99	Reaction99	binding of MAPK-PP on scaffold	$K\_1\_2 + S\_m1\_2\_0 \longrightarrow S\_2\_2\_0$	
100	Reaction100	dissociation of MAPK-PP from scaffold	$S\_2\_2\_0 \longrightarrow K\_1\_2 + S\_m1\_2\_0$	
101	Reaction101	binding of MAPK-PP on scaffold	$K\_1\_2 + S\_m1\_2\_1 \longrightarrow S\_2\_2\_1$	
102	Reaction102	dissociation of MAPK-PP from scaffold	$S\_2\_2\_1 \longrightarrow K\_1\_2 + S\_m1\_2\_1$	
103	Reaction103	binding of MEK on scaffold	$K\_2\_0 + S\_m1\_m1\_m1 \longrightarrow S\_m1\_0\_m1$	
104	Reaction104	dissociation of MEK from scaffold	$S\_m1\_0\_m1 \longrightarrow K\_2\_0 + S\_m1\_m1\_m1$	
105	Reaction105	binding of MEK on scaffold	$K\_2\_0 + S\_m1\_m1\_0 \longrightarrow S\_m1\_0\_0$	
106	Reaction106	dissociation of MEK from scaffold	$S\_m1\_0\_0 \longrightarrow K\_2\_0 + S\_m1\_m1\_0$	
107	Reaction107	binding of MEK on scaffold	$K\_2\_0 + S\_m1\_m1\_1 \longrightarrow S\_m1\_0\_1$	
108	Reaction108	dissociation of MEK from scaffold	$S\_m1\_0\_1 \longrightarrow K\_2\_0 + S\_m1\_m1\_1$	
109	Reaction109	binding of MEK-P on scaffold	$K\_2\_1 + S\_m1\_m1\_m1 \longrightarrow S\_m1\_1\_m1$	

№	Id	Name	Reaction Equation	SBO
110	Reaction110	dissociation of MEK-P from scaffold	$S\_m1\_1\_m1 \longrightarrow K\_2\_1 + S\_m1\_m1\_m1$	
111	Reaction111	binding of MEK-P on scaffold	$K\_2\_1 + S\_m1\_m1\_0 \longrightarrow S\_m1\_1\_0$	
112	Reaction112	dissociation of MEK-P from scaffold	$S\_m1\_1\_0 \longrightarrow K\_2\_1 + S\_m1\_m1\_0$	
113	Reaction113	binding of MEK-P on scaffold	$K\_2\_1 + S\_m1\_m1\_1 \longrightarrow S\_m1\_1\_1$	
114	Reaction114	dissociation of MEK-P from scaffold	$S\_m1\_1\_1 \longrightarrow K\_2\_1 + S\_m1\_m1\_1$	
115	Reaction115	binding of MEK-PP on scaffold	$K\_2\_2 + S\_m1\_m1\_m1 \longrightarrow S\_m1\_2\_m1$	
116	Reaction116	dissociation of MEK-PP from scaffold	$S\_m1\_2\_m1 \longrightarrow K\_2\_2 + S\_m1\_m1\_m1$	
117	Reaction117	binding of MEK-PP on scaffold	$K\_2\_2 + S\_m1\_m1\_0 \longrightarrow S\_m1\_2\_0$	
118	Reaction118	dissociation of MEK-PP from scaffold	$S\_m1\_2\_0 \longrightarrow K\_2\_2 + S\_m1\_m1\_0$	
119	Reaction119	binding of MEK-PP on scaffold	$K\_2\_2 + S\_m1\_m1\_1 \longrightarrow S\_m1\_2\_1$	
120	Reaction120	dissociation of MEK-PP from scaffold	$S\_m1\_2\_1 \longrightarrow K\_2\_2 + S\_m1\_m1\_1$	
121	Reaction121	binding of MEK on scaffold	$K\_2\_0 + S\_0\_m1\_m1 \longrightarrow S\_0\_0\_m1$	
122	Reaction122	dissociation of MEK from scaffold	$S\_0\_0\_m1 \longrightarrow K\_2\_0 + S\_0\_m1\_m1$	
123	Reaction123	binding of MEK on scaffold	$K\_2\_0 + S\_0\_m1\_0 \longrightarrow S\_0\_0\_0$	
124	Reaction124	dissociation of MEK from scaffold	$S\_0\_0\_0 \longrightarrow K\_2\_0 + S\_0\_m1\_0$	
125	Reaction125	binding of MEK on scaffold	$K\_2\_0 + S\_0\_m1\_1 \longrightarrow S\_0\_0\_1$	
126	Reaction126	dissociation of MEK from scaffold	$S\_0\_0\_1 \longrightarrow K\_2\_0 + S\_0\_m1\_1$	
127	Reaction127	binding of MEK-P on scaffold	$K\_2\_1 + S\_0\_m1\_m1 \longrightarrow S\_0\_1\_m1$	
128	Reaction128	dissociation of MEK-P from scaffold	$S\_0\_1\_m1 \longrightarrow K\_2\_1 + S\_0\_m1\_m1$	
129	Reaction129	binding of MEK-P on scaffold	$K\_2\_1 + S\_0\_m1\_0 \longrightarrow S\_0\_1\_0$	
130	Reaction130	dissociation of MEK-P from scaffold	$S\_0\_1\_0 \longrightarrow K\_2\_1 + S\_0\_m1\_0$	
131	Reaction131	binding of MEK-P on scaffold	$K\_2\_1 + S\_0\_m1\_1 \longrightarrow S\_0\_1\_1$	
132	Reaction132	dissociation of MEK-P from scaffold	$S\_0\_1\_1 \longrightarrow K\_2\_1 + S\_0\_m1\_1$	
133	Reaction133	binding of MEK-PP on scaffold	$K\_2\_2 + S\_0\_m1\_m1 \longrightarrow S\_0\_2\_m1$	
134	Reaction134	dissociation of MEK-PP from scaffold	$S\_0\_2\_m1 \longrightarrow K\_2\_2 + S\_0\_m1\_m1$	
135	Reaction135	binding of MEK-PP on scaffold	$K\_2\_2 + S\_0\_m1\_0 \longrightarrow S\_0\_2\_0$	
136	Reaction136	dissociation of MEK-PP from scaffold	$S\_0\_2\_0 \longrightarrow K\_2\_2 + S\_0\_m1\_0$	
137	Reaction137	binding of MEK-PP on scaffold	$K\_2\_2 + S\_0\_m1\_1 \longrightarrow S\_0\_2\_1$	
138	Reaction138	dissociation of MEK-PP from scaffold	$S\_0\_2\_1 \longrightarrow K\_2\_2 + S\_0\_m1\_1$	

№	Id	Name	Reaction Equation	SBO
139	Reaction139	binding of MEK on scaffold	$K\_2\_0 + S\_1\_m1\_m1 \longrightarrow S\_1\_0\_m1$	
140	Reaction140	dissociation of MEK from scaffold	$S\_1\_0\_m1 \longrightarrow K\_2\_0 + S\_1\_m1\_m1$	
141	Reaction141	binding of MEK on scaffold	$K\_2\_0 + S\_1\_m1\_0 \longrightarrow S\_1\_0\_0$	
142	Reaction142	dissociation of MEK from scaffold	$S\_1\_0\_0 \longrightarrow K\_2\_0 + S\_1\_m1\_0$	
143	Reaction143	binding of MEK on scaffold	$K\_2\_0 + S\_1\_m1\_1 \longrightarrow S\_1\_0\_1$	
144	Reaction144	dissociation of MEK from scaffold	$S\_1\_0\_1 \longrightarrow K\_2\_0 + S\_1\_m1\_1$	
145	Reaction145	binding of MEK-P on scaffold	$K\_2\_1 + S\_1\_m1\_m1 \longrightarrow S\_1\_1\_m1$	
146	Reaction146	dissociation of MEK-P from scaffold	$S\_1\_1\_m1 \longrightarrow K\_2\_1 + S\_1\_m1\_m1$	
147	Reaction147	binding of MEK-P on scaffold	$K\_2\_1 + S\_1\_m1\_0 \longrightarrow S\_1\_1\_0$	
148	Reaction148	dissociation of MEK-P from scaffold	$S\_1\_1\_0 \longrightarrow K\_2\_1 + S\_1\_m1\_0$	
149	Reaction149	binding of MEK-P on scaffold	$K\_2\_1 + S\_1\_m1\_1 \longrightarrow S\_1\_1\_1$	
150	Reaction150	dissociation of MEK-P from scaffold	$S\_1\_1\_1 \longrightarrow K\_2\_1 + S\_1\_m1\_1$	
151	Reaction151	binding of MEK-PP on scaffold	$K\_2\_2 + S\_1\_m1\_m1 \longrightarrow S\_1\_2\_m1$	
152	Reaction152	dissociation of MEK-PP from scaffold	$S\_1\_2\_m1 \longrightarrow K\_2\_2 + S\_1\_m1\_m1$	
153	Reaction153	binding of MEK-PP on scaffold	$K\_2\_2 + S\_1\_m1\_0 \longrightarrow S\_1\_2\_0$	
154	Reaction154	dissociation of MEK-PP from scaffold	$S\_1\_2\_0 \longrightarrow K\_2\_2 + S\_1\_m1\_0$	
155	Reaction155	binding of MEK-PP on scaffold	$K\_2\_2 + S\_1\_m1\_1 \longrightarrow S\_1\_2\_1$	
156	Reaction156	dissociation of MEK-PP from scaffold	$S\_1\_2\_1 \longrightarrow K\_2\_2 + S\_1\_m1\_1$	
157	Reaction157	binding of MEK on scaffold	$K\_2\_0 + S\_2\_m1\_m1 \longrightarrow S\_2\_0\_m1$	
158	Reaction158	dissociation of MEK from scaffold	$S\_2\_0\_m1 \longrightarrow K\_2\_0 + S\_2\_m1\_m1$	
159	Reaction159	binding of MEK on scaffold	$K\_2\_0 + S\_2\_m1\_0 \longrightarrow S\_2\_0\_0$	
160	Reaction160	dissociation of MEK from scaffold	$S\_2\_0\_0 \longrightarrow K\_2\_0 + S\_2\_m1\_0$	
161	Reaction161	binding of MEK on scaffold	$K\_2\_0 + S\_2\_m1\_1 \longrightarrow S\_2\_0\_1$	
162	Reaction162	dissociation of MEK from scaffold	$S\_2\_0\_1 \longrightarrow K\_2\_0 + S\_2\_m1\_1$	
163	Reaction163	binding of MEK-P on scaffold	$K\_2\_1 + S\_2\_m1\_m1 \longrightarrow S\_2\_1\_m1$	
164	Reaction164	dissociation of MEK-P from scaffold	$S\_2\_1\_m1 \longrightarrow K\_2\_1 + S\_2\_m1\_m1$	
165	Reaction165	binding of MEK-P on scaffold	$K\_2\_1 + S\_2\_m1\_0 \longrightarrow S\_2\_1\_0$	
166	Reaction166	dissociation of MEK-P from scaffold	$S\_2\_1\_0 \longrightarrow K\_2\_1 + S\_2\_m1\_0$	
167	Reaction167	binding of MEK-P on scaffold	$K\_2\_1 + S\_2\_m1\_1 \longrightarrow S\_2\_1\_1$	

№	Id	Name	Reaction Equation	SBO
168	Reaction168	dissociation of MEK-P from scaffold	$S\_2\_1\_1 \longrightarrow K\_2\_1 + S\_2\_m1\_1$	
169	Reaction169	binding of MEK-PP on scaffold	$K\_2\_2 + S\_2\_m1\_m1 \longrightarrow S\_2\_2\_m1$	
170	Reaction170	dissociation of MEK-PP from scaffold	$S\_2\_2\_m1 \longrightarrow K\_2\_2 + S\_2\_m1\_m1$	
171	Reaction171	binding of MEK-PP on scaffold	$K\_2\_2 + S\_2\_m1\_0 \longrightarrow S\_2\_2\_0$	
172	Reaction172	dissociation of MEK-PP from scaffold	$S\_2\_2\_0 \longrightarrow K\_2\_2 + S\_2\_m1\_0$	
173	Reaction173	binding of MEK-PP on scaffold	$K\_2\_2 + S\_2\_m1\_1 \longrightarrow S\_2\_2\_1$	
174	Reaction174	dissociation of MEK-PP from scaffold	$S\_2\_2\_1 \longrightarrow K\_2\_2 + S\_2\_m1\_1$	
175	Reaction175	binding of RAF on scaffold	$K\_3\_0 + S\_m1\_m1\_m1 \longrightarrow S\_m1\_m1\_0$	
176	Reaction176	dissociation of RAF from scaffold	$S\_m1\_m1\_0 \longrightarrow K\_3\_0 + S\_m1\_m1\_m1$	
177	Reaction177	binding of RAF-P on scaffold	$K\_3\_1 + S\_m1\_m1\_m1 \longrightarrow S\_m1\_m1\_1$	
178	Reaction178	dissociation of RAF-P from scaffold	$S\_m1\_m1\_1 \longrightarrow K\_3\_1 + S\_m1\_m1\_m1$	
179	Reaction179	binding of RAF on scaffold	$K\_3\_0 + S\_m1\_0\_m1 \longrightarrow S\_m1\_0\_0$	
180	Reaction180	dissociation of RAF from scaffold	$S\_m1\_0\_0 \longrightarrow K\_3\_0 + S\_m1\_0\_m1$	
181	Reaction181	binding of RAF-P on scaffold	$K\_3\_1 + S\_m1\_0\_m1 \longrightarrow S\_m1\_0\_1$	
182	Reaction182	dissociation of RAF-P from scaffold	$S\_m1\_0\_1 \longrightarrow K\_3\_1 + S\_m1\_0\_m1$	
183	Reaction183	binding of RAF on scaffold	$K\_3\_0 + S\_m1\_1\_m1 \longrightarrow S\_m1\_1\_0$	
184	Reaction184	dissociation of RAF from scaffold	$S\_m1\_1\_0 \longrightarrow K\_3\_0 + S\_m1\_1\_m1$	
185	Reaction185	binding of RAF-P on scaffold	$K\_3\_1 + S\_m1\_1\_m1 \longrightarrow S\_m1\_1\_1$	
186	Reaction186	dissociation of RAF-P from scaffold	$S\_m1\_1\_1 \longrightarrow K\_3\_1 + S\_m1\_1\_m1$	
187	Reaction187	binding of RAF on scaffold	$K\_3\_0 + S\_m1\_2\_m1 \longrightarrow S\_m1\_2\_0$	
188	Reaction188	dissociation of RAF from scaffold	$S\_m1\_2\_0 \longrightarrow K\_3\_0 + S\_m1\_2\_m1$	
189	Reaction189	binding of RAF-P on scaffold	$K\_3\_1 + S\_m1\_2\_m1 \longrightarrow S\_m1\_2\_1$	
190	Reaction190	dissociation of RAF-P from scaffold	$S\_m1\_2\_1 \longrightarrow K\_3\_1 + S\_m1\_2\_m1$	
191	Reaction191	binding of RAF on scaffold	$K\_3\_0 + S\_0\_m1\_m1 \longrightarrow S\_0\_m1\_0$	
192	Reaction192	dissociation of RAF from scaffold	$S\_0\_m1\_0 \longrightarrow K\_3\_0 + S\_0\_m1\_m1$	
193	Reaction193	binding of RAF-P on scaffold	$K\_3\_1 + S\_0\_m1\_m1 \longrightarrow S\_0\_m1\_1$	
194	Reaction194	dissociation of RAF-P from scaffold	$S\_0\_m1\_1 \longrightarrow K\_3\_1 + S\_0\_m1\_m1$	
195	Reaction195	binding of RAF on scaffold	$K\_3\_0 + S\_0\_0\_m1 \longrightarrow S\_0\_0\_0$	
196	Reaction196	dissociation of RAF from scaffold	$S\_0\_0\_0 \longrightarrow K\_3\_0 + S\_0\_0\_m1$	

№	Id	Name	Reaction Equation	SBO
197	Reaction197	binding of RAF-P on scaffold	$K\_3\_1 + S\_0\_0\_m1 \longrightarrow S\_0\_0\_1$	
198	Reaction198	dissociation of RAF from scaffold	$S\_0\_0\_1 \longrightarrow K\_3\_1 + S\_0\_0\_m1$	
199	Reaction199	binding of RAF on scaffold	$K\_3\_0 + S\_0\_1\_m1 \longrightarrow S\_0\_1\_0$	
200	Reaction200	dissociation of RAF from scaffold	$S\_0\_1\_0 \longrightarrow K\_3\_0 + S\_0\_1\_m1$	
201	Reaction201	binding of RAF-P on scaffold	$K\_3\_1 + S\_0\_1\_m1 \longrightarrow S\_0\_1\_1$	
202	Reaction202	dissociation of RAF-P from scaffold	$S\_0\_1\_1 \longrightarrow K\_3\_1 + S\_0\_1\_m1$	
203	Reaction203	binding of RAF on scaffold	$K\_3\_0 + S\_0\_2\_m1 \longrightarrow S\_0\_2\_0$	
204	Reaction204	dissociation of RAF from scaffold	$S\_0\_2\_0 \longrightarrow K\_3\_0 + S\_0\_2\_m1$	
205	Reaction205	binding of RAF-P on scaffold	$K\_3\_1 + S\_0\_2\_m1 \longrightarrow S\_0\_2\_1$	
206	Reaction206	dissociation of RAF-P from scaffold	$S\_0\_2\_1 \longrightarrow K\_3\_1 + S\_0\_2\_m1$	
207	Reaction207	binding of RAF on scaffold	$K\_3\_0 + S\_1\_m1\_m1 \longrightarrow S\_1\_m1\_0$	
208	Reaction208	dissociation of RAF from scaffold	$S\_1\_m1\_0 \longrightarrow K\_3\_0 + S\_1\_m1\_m1$	
209	Reaction209	binding of RAF-P on scaffold	$K\_3\_1 + S\_1\_m1\_m1 \longrightarrow S\_1\_m1\_1$	
210	Reaction210	dissociation of RAF-P from scaffold	$S\_1\_m1\_1 \longrightarrow K\_3\_1 + S\_1\_m1\_m1$	
211	Reaction211	binding of RAF on scaffold	$K\_3\_0 + S\_1\_0\_m1 \longrightarrow S\_1\_0\_0$	
212	Reaction212	dissociation of RAF from scaffold	$S\_1\_0\_0 \longrightarrow K\_3\_0 + S\_1\_0\_m1$	
213	Reaction213	binding of RAF-P on scaffold	$K\_3\_1 + S\_1\_0\_m1 \longrightarrow S\_1\_0\_1$	
214	Reaction214	dissociation of RAF-P from scaffold	$S\_1\_0\_1 \longrightarrow K\_3\_1 + S\_1\_0\_m1$	
215	Reaction215	binding of RAF on scaffold	$K\_3\_0 + S\_1\_1\_m1 \longrightarrow S\_1\_1\_0$	
216	Reaction216	dissociation of RAF from scaffold	$S\_1\_1\_0 \longrightarrow K\_3\_0 + S\_1\_1\_m1$	
217	Reaction217	binding of RAF-P on scaffold	$K\_3\_1 + S\_1\_1\_m1 \longrightarrow S\_1\_1\_1$	
218	Reaction218	dissociation of RAF-P from scaffold	$S\_1\_1\_1 \longrightarrow K\_3\_1 + S\_1\_1\_m1$	
219	Reaction219	binding of RAF on scaffold	$K\_3\_0 + S\_1\_2\_m1 \longrightarrow S\_1\_2\_0$	
220	Reaction220	dissociation of RAF from scaffold	$S\_1\_2\_0 \longrightarrow K\_3\_0 + S\_1\_2\_m1$	
221	Reaction221	binding of RAF-P on scaffold	$K\_3\_1 + S\_1\_2\_m1 \longrightarrow S\_1\_2\_1$	
222	Reaction222	dissociation of RAF-P from scaffold	$S\_1\_2\_1 \longrightarrow K\_3\_1 + S\_1\_2\_m1$	
223	Reaction223	binding of RAF on scaffold	$K\_3\_0 + S\_2\_m1\_m1 \longrightarrow S\_2\_m1\_0$	
224	Reaction224	dissociation of RAF from scaffold	$S\_2\_m1\_0 \longrightarrow K\_3\_0 + S\_2\_m1\_m1$	
225	Reaction225	binding of RAF-P on scaffold	$K\_3\_1 + S\_2\_m1\_m1 \longrightarrow S\_2\_m1\_1$	

№	Id	Name	Reaction Equation	SBO
226	Reaction226	dissociation of RAF-P from scaffold	$S\_2\_m1\_1 \longrightarrow K\_3\_1 + S\_2\_m1\_m1$	
227	Reaction227	binding of RAF on scaffold	$K\_3\_0 + S\_2\_0\_m1 \longrightarrow S\_2\_0\_0$	
228	Reaction228	dissociation of RAF from scaffold	$S\_2\_0\_0 \longrightarrow K\_3\_0 + S\_2\_0\_m1$	
229	Reaction229	binding of RAF-P on scaffold	$K\_3\_1 + S\_2\_0\_m1 \longrightarrow S\_2\_0\_1$	
230	Reaction230	dissociation of RAF-P from scaffold	$S\_2\_0\_1 \longrightarrow K\_3\_1 + S\_2\_0\_m1$	
231	Reaction231	binding of RAF on scaffold	$K\_3\_0 + S\_2\_1\_m1 \longrightarrow S\_2\_1\_0$	
232	Reaction232	dissociation of RAF from scaffold	$S\_2\_1\_0 \longrightarrow K\_3\_0 + S\_2\_1\_m1$	
233	Reaction233	binding of RAF-P on scaffold	$K\_3\_1 + S\_2\_1\_m1 \longrightarrow S\_2\_1\_1$	
234	Reaction234	dissociation of RAF-P from scaffold	$S\_2\_1\_1 \longrightarrow K\_3\_1 + S\_2\_1\_m1$	
235	Reaction235	binding of RAF on scaffold	$K\_3\_0 + S\_2\_2\_m1 \longrightarrow S\_2\_2\_0$	
236	Reaction236	dissociation of RAF from scaffold	$S\_2\_2\_0 \longrightarrow K\_3\_0 + S\_2\_2\_m1$	
237	Reaction237	binding of RAF-P on scaffold	$K\_3\_1 + S\_2\_2\_m1 \longrightarrow S\_2\_2\_1$	
238	Reaction238	dissociation of RAF-P from scaffold	$S\_2\_2\_1 \longrightarrow K\_3\_1 + S\_2\_2\_m1$	
239	Reaction239	phosphorylation of MAPK on scaffold	$S\_0\_2\_m1 \longrightarrow S\_1\_2\_m1$	
240	Reaction240	phosphorylation of MAPK on scaffold	$S\_0\_2\_0 \longrightarrow S\_1\_2\_0$	
241	Reaction241	phosphorylation of MAPK on scaffold	$S\_0\_2\_1 \longrightarrow S\_1\_2\_1$	
242	Reaction242	phosphorylation of MAPK-P on scaffold	$S\_1\_2\_m1 \longrightarrow S\_2\_2\_m1$	
243	Reaction243	phosphorylation of MAPK-P on scaffold	$S\_1\_2\_0 \longrightarrow S\_2\_2\_0$	
244	Reaction244	phosphorylation of MAPK-P on scaffold	$S\_1\_2\_1 \longrightarrow S\_2\_2\_1$	
245	Reaction245	phosphorylation of MEK on scaffold	$S\_m1\_0\_1 \longrightarrow S\_m1\_1\_1$	
246	Reaction246	phosphorylation of MEK-P on scaffold	$S\_m1\_1\_1 \longrightarrow S\_m1\_2\_1$	
247	Reaction247	phosphorylation of MEK on scaffold	$S\_0\_0\_1 \longrightarrow S\_0\_1\_1$	
248	Reaction248	phosphorylation of MEK-P on scaffold	$S\_0\_1\_1 \longrightarrow S\_0\_2\_1$	
249	Reaction249	phosphorylation of MEK on scaffold	$S\_1\_0\_1 \longrightarrow S\_1\_1\_1$	
250	Reaction250	phosphorylation of MEK-P on scaffold	$S\_1\_1\_1 \longrightarrow S\_1\_2\_1$	
251	Reaction251	phosphorylation of MEK on scaffold	$S\_2\_0\_1 \longrightarrow S\_2\_1\_1$	
252	Reaction252	phosphorylation of MEK-P on scaffold	$S\_2\_1\_1 \longrightarrow S\_2\_2\_1$	
253	Reaction253	binding of RAF and RAFK	$RAFK + S\_m1\_m1\_0 \longrightarrow S\_RAFK\_m1\_m1\_0$	
254	Reaction254	dissociation of RAF_RAFK	$S\_RAFK\_m1\_m1\_0 \longrightarrow RAFK + S\_m1\_m1\_0$	

№	Id	Name	Reaction Equation	SBO
255	Reaction255	phosphorylation of RAF on scaffold	$S\_RAFK\_m1\_m1\_0 \longrightarrow RAFK + S\_m1\_m1\_1$	
256	Reaction256	binding of RAF and RAFK	$RAFK + S\_m1\_0\_0 \longrightarrow S\_RAFK\_m1\_0\_0$	
257	Reaction257	dissociation of RAF_RAFK	$S\_RAFK\_m1\_0\_0 \longrightarrow RAFK + S\_m1\_0\_0$	
258	Reaction258	phosphorylation of RAF on scaffold	$S\_RAFK\_m1\_0\_0 \longrightarrow RAFK + S\_m1\_0\_1$	
259	Reaction259	binding of RAF and RAFK	$RAFK + S\_m1\_1\_0 \longrightarrow S\_RAFK\_m1\_1\_0$	
260	Reaction260	dissociation of RAF_RAFK	$S\_RAFK\_m1\_1\_0 \longrightarrow RAFK + S\_m1\_1\_0$	
261	Reaction261	phosphorylation of RAF on scaffold	$S\_RAFK\_m1\_1\_0 \longrightarrow RAFK + S\_m1\_1\_1$	
262	Reaction262	binding of RAF and RAFK	$RAFK + S\_m1\_2\_0 \longrightarrow S\_RAFK\_m1\_2\_0$	
263	Reaction263	dissociation of RAF_RAFK	$S\_RAFK\_m1\_2\_0 \longrightarrow RAFK + S\_m1\_2\_0$	
264	Reaction264	phosphorylation of RAF on scaffold	$S\_RAFK\_m1\_2\_0 \longrightarrow RAFK + S\_m1\_2\_1$	
265	Reaction265	binding of RAF and RAFK	$RAFK + S\_0\_m1\_0 \longrightarrow S\_RAFK\_0\_m1\_0$	
266	Reaction266	dissociation of RAF_RAFK	$S\_RAFK\_0\_m1\_0 \longrightarrow RAFK + S\_0\_m1\_0$	
267	Reaction267	phosphorylation of RAF on scaffold	$S\_RAFK\_0\_m1\_0 \longrightarrow RAFK + S\_0\_m1\_1$	
268	Reaction268	binding of RAF and RAFK	$RAFK + S\_0\_0\_0 \longrightarrow S\_RAFK\_0\_0\_0$	
269	Reaction269	dissociation of RAF_RAFK	$S\_RAFK\_0\_0\_0 \longrightarrow RAFK + S\_0\_0\_0$	
270	Reaction270	phosphorylation of RAF on scaffold	$S\_RAFK\_0\_0\_0 \longrightarrow RAFK + S\_0\_0\_1$	
271	Reaction271	binding of RAF and RAFK	$RAFK + S\_0\_1\_0 \longrightarrow S\_RAFK\_0\_1\_0$	
272	Reaction272	dissociation of RAF_RAFK	$S\_RAFK\_0\_1\_0 \longrightarrow RAFK + S\_0\_1\_0$	
273	Reaction273	phosphorylation of RAF on scaffold	$S\_RAFK\_0\_1\_0 \longrightarrow RAFK + S\_0\_1\_1$	
274	Reaction274	binding of RAF and RAFK	$RAFK + S\_0\_2\_0 \longrightarrow S\_RAFK\_0\_2\_0$	
275	Reaction275	dissociation of RAF_RAFK	$S\_RAFK\_0\_2\_0 \longrightarrow RAFK + S\_0\_2\_0$	
276	Reaction276	phosphorylation of RAF on scaffold	$S\_RAFK\_0\_2\_0 \longrightarrow RAFK + S\_0\_2\_1$	
277	Reaction277	binding of RAF and RAFK	$RAFK + S\_1\_m1\_0 \longrightarrow S\_RAFK\_1\_m1\_0$	
278	Reaction278	dissociation of RAF_RAFK	$S\_RAFK\_1\_m1\_0 \longrightarrow RAFK + S\_1\_m1\_0$	
279	Reaction279	phosphorylation of RAF on scaffold	$S\_RAFK\_1\_m1\_0 \longrightarrow RAFK + S\_1\_m1\_1$	
280	Reaction280	binding of RAF and RAFK	$RAFK + S\_1\_0\_0 \longrightarrow S\_RAFK\_1\_0\_0$	
281	Reaction281	dissociation of RAF_RAFK	$S\_RAFK\_1\_0\_0 \longrightarrow RAFK + S\_1\_0\_0$	
282	Reaction282	phosphorylation of RAF on scaffold	$S\_RAFK\_1\_0\_0 \longrightarrow RAFK + S\_1\_0\_1$	
283	Reaction283	binding of RAF and RAFK	$RAFK + S\_1\_1\_0 \longrightarrow S\_RAFK\_1\_1\_0$	

№	Id	Name	Reaction Equation	SBO
284	Reaction284	dissociation of RAF_RAFK	S_RAFK_1_1_0 $\longrightarrow$ RAFK + S_1_1_0	
285	Reaction285	phosphorylation of RAF on scaffold	S_RAFK_1_1_0 $\longrightarrow$ RAFK + S_1_1_1	
286	Reaction286	binding of RAF and RAFK	RAFK + S_1_2_0 $\longrightarrow$ S_RAFK_1_2_0	
287	Reaction287	dissociation of RAF_RAFK	S_RAFK_1_2_0 $\longrightarrow$ RAFK + S_1_2_0	
288	Reaction288	phosphorylation of RAF on scaffold	S_RAFK_1_2_0 $\longrightarrow$ RAFK + S_1_2_1	
289	Reaction289	binding of RAF and RAFK	RAFK + S_2_m1_0 $\longrightarrow$ S_RAFK_2_m1_0	
290	Reaction290	dissociation of RAF_RAFK	S_RAFK_2_m1_0 $\longrightarrow$ RAFK + S_2_m1_0	
291	Reaction291	phosphorylation of RAF on scaffold	S_RAFK_2_m1_0 $\longrightarrow$ RAFK + S_2_m1_1	
292	Reaction292	binding of RAF and RAFK	RAFK + S_2_0_0 $\longrightarrow$ S_RAFK_2_0_0	
293	Reaction293	dissociation of RAF_RAFK	S_RAFK_2_0_0 $\longrightarrow$ RAFK + S_2_0_0	
294	Reaction294	phosphorylation of RAF on scaffold	S_RAFK_2_0_0 $\longrightarrow$ RAFK + S_2_0_1	
295	Reaction295	binding of RAF and RAFK	RAFK + S_2_1_0 $\longrightarrow$ S_RAFK_2_1_0	
296	Reaction296	dissociation of RAF_RAFK	S_RAFK_2_1_0 $\longrightarrow$ RAFK + S_2_1_0	
297	Reaction297	phosphorylation of RAF on scaffold	S_RAFK_2_1_0 $\longrightarrow$ RAFK + S_2_1_1	
298	Reaction298	binding of RAF and RAFK	RAFK + S_2_2_0 $\longrightarrow$ S_RAFK_2_2_0	
299	Reaction299	dissociation of RAF_RAFK	S_RAFK_2_2_0 $\longrightarrow$ RAFK + S_2_2_0	
300	Reaction300	phosphorylation of RAF on scaffold	S_RAFK_2_2_0 $\longrightarrow$ RAFK + S_2_2_1	

5.1 Reaction `Reaction1`

This is an irreversible reaction of two reactants forming one product.

Name binding of RAF and RAFK

Reaction equation
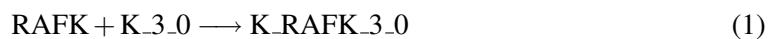
$$RAFK + K\_3\_0 \longrightarrow K\_RAFK\_3\_0 \tag{1}$$

Reactants

Table 9: Properties of each reactant.

Id	Name	SBO
RAFK	RAF kinase	
K_3_0	RAF	

Product

Table 10: Properties of each product.

Id	Name	SBO
K_RAFK_3_0	RAF_RAFK	

Kinetic Law

Derived unit contains undeclared units

$$v_1 = a1 \cdot RAFK \cdot K\_3\_0 \tag{2}$$

Table 11: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
a1			1.0		☑

5.2 Reaction `Reaction2`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of RAF_RAFK

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Reaction equation
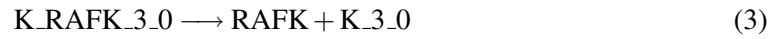
$$K\_RAFK\_3\_0 \longrightarrow RAFK + K\_3\_0 \tag{3}$$

Reactant

Table 12: Properties of each reactant.

Id	Name	SBO
K_RAFK_3_0	RAF_RAFK	

Products

Table 13: Properties of each product.

Id	Name	SBO
RAFK	RAF kinase	
K_3_0	RAF	

Kinetic Law

Derived unit contains undeclared units

$$v_2 = d1 \cdot K\_RAFK\_3\_0 \tag{4}$$

Table 14: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
d1			0.4		☑

5.3 Reaction `Reaction3`

This is an irreversible reaction of one reactant forming two products.

Name phosphorylation of RAF

Reaction equation
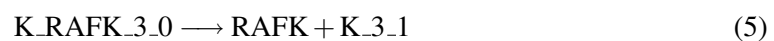
$$K\_RAFK\_3\_0 \longrightarrow RAFK + K\_3\_1 \tag{5}$$

Reactant

Table 15: Properties of each reactant.

Id	Name	SBO
K_RAFK_3_0	RAF_RAFK	

Products

Table 16: Properties of each product.

Id	Name	SBO
RAFK	RAF kinase	
K_3_1	RAF-P	

Kinetic Law

Derived unit contains undeclared units

$$v_3 = k1 \cdot K\_RAFK\_3\_0 \tag{6}$$

Table 17: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			0.1		☑

5.4 Reaction `Reaction4`

This is an irreversible reaction of two reactants forming one product.

Name binding of RAF-P and RAF phosphatase

Reaction equation
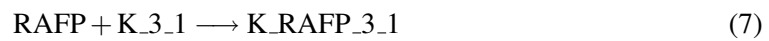
$$RAFP + K\_3\_1 \longrightarrow K\_RAFP\_3\_1 \tag{7}$$

Reactants

Table 18: Properties of each reactant.

Id	Name	SBO
RAFP	RAF phosphatase	
K_3_1	RAF-P	

Product

Table 19: Properties of each product.

Id	Name	SBO
K_RAFP_3_1	RAF-P_RAFPase	

Kinetic Law

Derived unit contains undeclared units

$$v_4 = a2 \cdot RAFP \cdot K\_3\_1 \tag{8}$$

Table 20: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
a2			0.5		☑

5.5 Reaction `Reaction5`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of RAF-P_RAFPase

Reaction equation
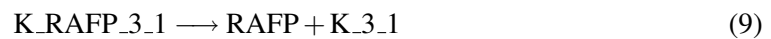
$$K\_RAFP\_3\_1 \longrightarrow RAFP + K\_3\_1 \tag{9}$$

Reactant

Table 21: Properties of each reactant.

Id	Name	SBO
K_RAFP_3_1	RAF-P_RAFPase	

Products

Table 22: Properties of each product.

Id	Name	SBO
RAFP	RAF phosphatase	

Id	Name	SBO
K_3_1	RAF-P	

Kinetic Law

Derived unit contains undeclared units

$$v_5 = \text{d2} \cdot \text{K\_RAFP\_3\_1} \tag{10}$$

Table 23: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
d2			0.5		☑

5.6 Reaction `Reaction6`

This is an irreversible reaction of one reactant forming two products.

Name dephosphorylation of RAF-P

Reaction equation
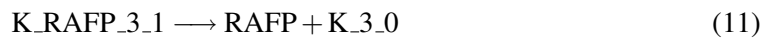
$$\text{K\_RAFP\_3\_1} \longrightarrow \text{RAFP} + \text{K\_3\_0} \tag{11}$$

Reactant

Table 24: Properties of each reactant.

Id	Name	SBO
K_RAFP_3_1	RAF-P_RAFPase	

Products

Table 25: Properties of each product.

Id	Name	SBO
RAFP	RAF phosphatase	
K_3_0	RAF	

Kinetic Law

Derived unit contains undeclared units

$$v_6 = \text{k2} \cdot \text{K\_RAFP\_3\_1} \tag{12}$$

Table 26: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k2			0.1		☑

5.7 Reaction `Reaction7`

This is an irreversible reaction of two reactants forming one product.

Name binding of MEK and RAF-P

Reaction equation

$$\text{K\_2\_0} + \text{K\_3\_1} \longrightarrow \text{K\_K\_2\_0\_3\_1} \tag{13}$$
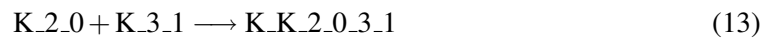
Reactants

Table 27: Properties of each reactant.

Id	Name	SBO
K_2_0	MEK	
K_3_1	RAF-P	

Product

Table 28: Properties of each product.

Id	Name	SBO
K_K_2_0_3_1	MEK_RAF-P	

Kinetic Law

Derived unit contains undeclared units

$$v_7 = \text{a3} \cdot \text{K\_2\_0} \cdot \text{K\_3\_1} \tag{14}$$

Table 29: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
a3			3.3		☑

5.8 Reaction `Reaction8`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of MEK_RAF-P

Reaction equation

$$K\_K\_2\_0\_3\_1 \longrightarrow K\_2\_0 + K\_3\_1 \tag{15}$$
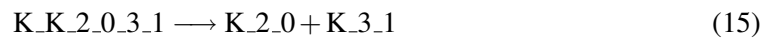
Reactant

Table 30: Properties of each reactant.

Id	Name	SBO
K_K_2_0_3_1	MEK_RAF-P	

Products

Table 31: Properties of each product.

Id	Name	SBO
K_2_0	MEK	
K_3_1	RAF-P	

Kinetic Law

Derived unit contains undeclared units

$$v_8 = d3 \cdot K\_K\_2\_0\_3\_1 \tag{16}$$

Table 32: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
d3			0.42		☑

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5.9 Reaction `Reaction9`

This is an irreversible reaction of one reactant forming two products.

Name phosphorylation of MEK

Reaction equation

$$K\_K\_2\_0\_3\_1 \longrightarrow K\_2\_1 + K\_3\_1 \tag{17}$$
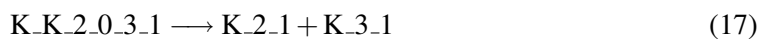
Reactant

Table 33: Properties of each reactant.

Id	Name	SBO
K_K_2_0_3_1	MEK_RAF-P	

Products

Table 34: Properties of each product.

Id	Name	SBO
K_2_1	MEK-P	
K_3_1	RAF-P	

Kinetic Law

Derived unit contains undeclared units

$$v_9 = k3 \cdot K\_K\_2\_0\_3\_1 \tag{18}$$

Table 35: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k3			0.1		☑

5.10 Reaction `Reaction10`

This is an irreversible reaction of two reactants forming one product.

Name binding of MEK-P and MEK phosphatase

Reaction equation
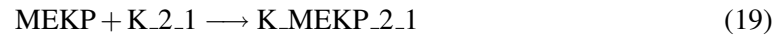
$$\text{MEKP} + \text{K\_2\_1} \longrightarrow \text{K\_MEKP\_2\_1} \tag{19}$$

Reactants

Table 36: Properties of each reactant.

Id	Name	SBO
MEKP	MEK phosphatase	
K_2_1	MEK-P	

Product

Table 37: Properties of each product.

Id	Name	SBO
K_MEKP_2_1	MEK-P_MEKPase	

Kinetic Law

Derived unit contains undeclared units

$$v_{10} = \text{a4} \cdot \text{MEKP} \cdot \text{K\_2\_1} \tag{20}$$

Table 38: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
a4			10.0		☑

5.11 Reaction `Reaction11`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of MEK-P_MEKPase

Reaction equation
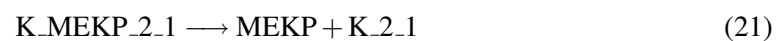
$$\text{K\_MEKP\_2\_1} \longrightarrow \text{MEKP} + \text{K\_2\_1} \tag{21}$$

Reactant

Table 39: Properties of each reactant.

Id	Name	SBO
K_MEKP_2_1	MEK-P_MEKPase	

Products

Table 40: Properties of each product.

Id	Name	SBO
MEKP	MEK phosphatase	
K_2_1	MEK-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{11} = \text{d4} \cdot \text{K\_MEKP\_2\_1} \tag{22}$$

Table 41: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
d4			0.8		☑

5.12 Reaction `Reaction12`

This is an irreversible reaction of one reactant forming two products.

Name dephosphorylation of MEK-P

Reaction equation
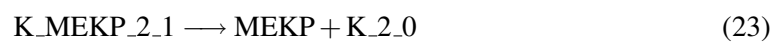
$$\text{K\_MEKP\_2\_1} \longrightarrow \text{MEKP} + \text{K\_2\_0} \tag{23}$$

Reactant

Table 42: Properties of each reactant.

Id	Name	SBO
K_MEKP_2_1	MEK-P_MEKPase	

Products

Table 43: Properties of each product.

Id	Name	SBO
MEKP	MEK phosphatase	
K_2_0	MEK	

Kinetic Law

Derived unit contains undeclared units

$$v_{12} = k4 \cdot \text{K\_MEKP\_2\_1} \tag{24}$$

Table 44: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k4			0.1		☑

5.13 Reaction `Reaction13`

This is an irreversible reaction of two reactants forming one product.

Name binding of MEK-P and RAF-P

Reaction equation

$$\text{K\_2\_1} + \text{K\_3\_1} \longrightarrow \text{K\_K\_2\_1\_3\_1} \tag{25}$$
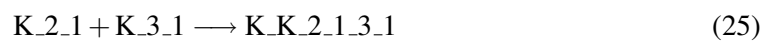
Reactants

Table 45: Properties of each reactant.

Id	Name	SBO
K_2_1	MEK-P	
K_3_1	RAF-P	

Product

Table 46: Properties of each product.

Id	Name	SBO
K_K_2_1_3_1	MEK-P_RAF-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{13} = \text{a5} \cdot \text{K\_2\_1} \cdot \text{K\_3\_1} \tag{26}$$

Table 47: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
a5			3.3		☑

5.14 Reaction `Reaction14`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of MEK-P_RAF-P

Reaction equation

$$\text{K\_K\_2\_1\_3\_1} \longrightarrow \text{K\_2\_1} + \text{K\_3\_1} \tag{27}$$
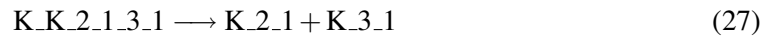
Reactant

Table 48: Properties of each reactant.

Id	Name	SBO
K_K_2_1_3_1	MEK-P_RAF-P	

Products

Table 49: Properties of each product.

Id	Name	SBO
K_2_1	MEK-P	
K_3_1	RAF-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{14} = d5 \cdot K\_K\_2\_1\_3\_1 \tag{28}$$

Table 50: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
d5			0.4		☑

5.15 Reaction `Reaction15`

This is an irreversible reaction of one reactant forming two products.

Name phosphorylation of MEK-P

Reaction equation

$$K\_K\_2\_1\_3\_1 \longrightarrow K\_2\_2 + K\_3\_1 \tag{29}$$
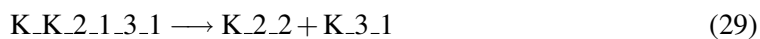
Reactant

Table 51: Properties of each reactant.

Id	Name	SBO
K_K_2_1_3_1	MEK-P_RAF-P	

Products

Table 52: Properties of each product.

Id	Name	SBO
K_2_2	MEK-PP	
K_3_1	RAF-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{15} = k5 \cdot K\_K\_2\_1\_3\_1 \tag{30}$$

Table 53: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k5			0.1		☑

5.16 Reaction `Reaction16`

This is an irreversible reaction of two reactants forming one product.

Name binding of MEK-PP and MEK phosphatase

Reaction equation
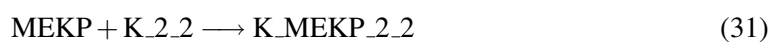
$$\text{MEKP} + \text{K\_2\_2} \longrightarrow \text{K\_MEKP\_2\_2} \tag{31}$$

Reactants

Table 54: Properties of each reactant.

Id	Name	SBO
MEKP	MEK phosphatase	
K_2_2	MEK-PP	

Product

Table 55: Properties of each product.

Id	Name	SBO
K_MEKP_2_2	MEK-PP_MEKPase	

Kinetic Law

Derived unit contains undeclared units

$$v_{16} = \text{a6} \cdot \text{MEKP} \cdot \text{K\_2\_2} \tag{32}$$

Table 56: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
a6			10.0		☑

5.17 Reaction `Reaction17`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of MEK-PP_MEKPase

Reaction equation
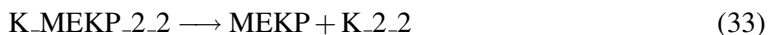
$$K\_MEKP\_2\_2 \longrightarrow MEKP + K\_2\_2 \tag{33}$$

Reactant

Table 57: Properties of each reactant.

Id	Name	SBO
K_MEKP_2_2	MEK-PP_MEKPase	

Products

Table 58: Properties of each product.

Id	Name	SBO
MEKP	MEK phosphatase	
K_2_2	MEK-PP	

Kinetic Law

Derived unit contains undeclared units

$$v_{17} = d6 \cdot K\_MEKP\_2\_2 \tag{34}$$

Table 59: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
d6			0.8		☑

5.18 Reaction `Reaction18`

This is an irreversible reaction of one reactant forming two products.

Name dephosphorylation of MEK-PP

Reaction equation
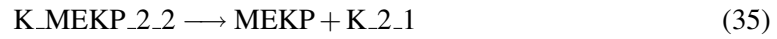
$$\text{K\_MEKP\_2\_2} \longrightarrow \text{MEKP} + \text{K\_2\_1} \tag{35}$$

Reactant

Table 60: Properties of each reactant.

Id	Name	SBO
K_MEKP_2_2	MEK-PP_MEKPase	

Products

Table 61: Properties of each product.

Id	Name	SBO
MEKP	MEK phosphatase	
K_2_1	MEK-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{18} = \text{k6} \cdot \text{K\_MEKP\_2\_2} \tag{36}$$

Table 62: Properties of each parameter.

| Id	Name	SBO	Value	Unit	Constant
k6			0.1		☑

5.19 Reaction `Reaction19`

This is an irreversible reaction of two reactants forming one product.

Name binding of MAPK and MEK-PP

Reaction equation

$$\text{K\_1\_0} + \text{K\_2\_2} \longrightarrow \text{K\_K\_1\_0\_2\_2} \tag{37}$$
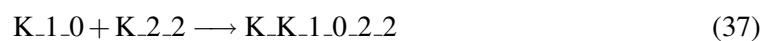
Reactants

Table 63: Properties of each reactant.

Id	Name	SBO
K_1_0	MAPK	
K_2_2	MEK-PP	

Product

Table 64: Properties of each product.

Id	Name	SBO
K_K_1_0_2_2	MAPK_MEK-PP	

Kinetic Law

Derived unit contains undeclared units

$$v_{19} = a7 \cdot K\_1\_0 \cdot K\_2\_2 \tag{38}$$

Table 65: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
a7			20.0		☑

5.20 Reaction Reaction20

This is an irreversible reaction of one reactant forming two products.

Name dissociation of MAPK_MEK-PP

Reaction equation

$$K\_K\_1\_0\_2\_2 \longrightarrow K\_1\_0 + K\_2\_2 \tag{39}$$
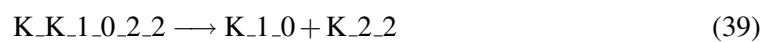
Reactant

Table 66: Properties of each reactant.

Id	Name	SBO
K_K_1_0_2_2	MAPK_MEK-PP	

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Products

Table 67: Properties of each product.

Id	Name	SBO
K_1_0	MAPK	
K_2_2	MEK-PP	

Kinetic Law

Derived unit contains undeclared units

$$v_{20} = \text{d7} \cdot \text{K\_K\_1\_0\_2\_2} \tag{40}$$

Table 68: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
d7			0.6		☑

5.21 Reaction `Reaction21`

This is an irreversible reaction of one reactant forming two products.

Name phosphorylation of MAPK

Reaction equation

$$\text{K\_K\_1\_0\_2\_2} \longrightarrow \text{K\_1\_1} + \text{K\_2\_2} \tag{41}$$
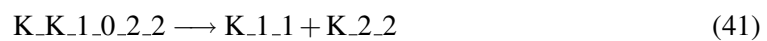
Reactant

Table 69: Properties of each reactant.

Id	Name	SBO
K_K_1_0_2_2	MAPK_MEK-PP	

Products

Table 70: Properties of each product.

Id	Name	SBO
K_1_1	MAPK-P	
K_2_2	MEK-PP	

Kinetic Law

Derived unit contains undeclared units

$$v_{21} = \text{k7} \cdot \text{K\_K\_1\_0\_2\_2} \tag{42}$$

Table 71: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k7			0.1		☑

5.22 Reaction `Reaction22`

This is an irreversible reaction of two reactants forming one product.

Name binding of MAPK-P and MAPK phosphatase

Reaction equation

$$\text{MAPKP} + \text{K\_1\_1} \longrightarrow \text{K\_MAPKP\_1\_1} \tag{43}$$
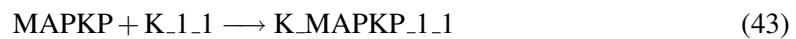
Reactants

Table 72: Properties of each reactant.

Id	Name	SBO
MAPKP	MAPK phosphatase	
K_1_1	MAPK-P	

Product

Table 73: Properties of each product.

Id	Name	SBO
K_MAPKP_1_1	MAPK-P_MAPKPase	

Kinetic Law

Derived unit contains undeclared units

$$v_{22} = \text{a8} \cdot \text{MAPKP} \cdot \text{K\_1\_1} \tag{44}$$

Table 74: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
a8			5.0		☑

5.23 Reaction `Reaction23`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of MAPK-P_MAPKPase

Reaction equation

$$\text{K\_MAPKP\_1\_1} \longrightarrow \text{MAPKP} + \text{K\_1\_1} \tag{45}$$
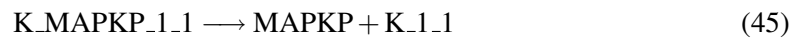
Reactant

Table 75: Properties of each reactant.

Id	Name	SBO
K_MAPKP_1_1	MAPK-P_MAPKPase	

Products

Table 76: Properties of each product.

Id	Name	SBO
MAPKP	MAPK phosphatase	
K_1_1	MAPK-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{23} = \text{d8} \cdot \text{K\_MAPKP\_1\_1} \tag{46}$$

Table 77: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
d8			0.4		☑

5.24 Reaction `Reaction24`

This is an irreversible reaction of one reactant forming two products.

Name dephosphorylation of MAPK-P

Reaction equation

$$K\_MAPKP\_1\_1 \longrightarrow MAPKP + K\_1\_0 \tag{47}$$
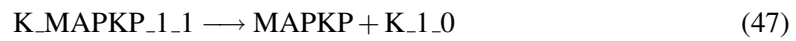
Reactant

Table 78: Properties of each reactant.

Id	Name	SBO
K_MAPKP_1_1	MAPK-P_MAPKPase	

Products

Table 79: Properties of each product.

Id	Name	SBO
MAPKP	MAPK phosphatase	
K_1_0	MAPK	

Kinetic Law

Derived unit contains undeclared units

$$v_{24} = k8 \cdot K\_MAPKP\_1\_1 \tag{48}$$

Table 80: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k8			0.1		☑

5.25 Reaction `Reaction25`

This is an irreversible reaction of two reactants forming one product.

Name binding of MAPK-P and MEK-PP

Reaction equation

$$K\_1\_1 + K\_2\_2 \longrightarrow K\_K\_1\_1\_2\_2 \tag{49}$$
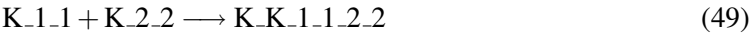
Reactants

Table 81: Properties of each reactant.

Id	Name	SBO
K_1_1	MAPK-P	
K_2_2	MEK-PP	

Product

Table 82: Properties of each product.

Id	Name	SBO
K_K_1_1_2_2	MAPK-P_MEK-PP	

Kinetic Law

Derived unit contains undeclared units

$$v_{25} = a9 \cdot K\_1\_1 \cdot K\_2\_2 \tag{50}$$

Table 83: Properties of each parameter.

| Id	Name	SBO	Value	Unit	Constant
a9			20.0		☑

5.26 Reaction `Reaction26`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of MAPK-P_MEK-PP

Reaction equation

$$K\_K\_1\_1\_2\_2 \longrightarrow K\_1\_1 + K\_2\_2 \qquad (51)$$
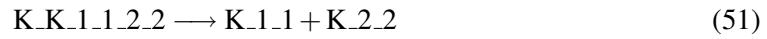
Reactant

Table 84: Properties of each reactant.

Id	Name	SBO
K_K_1_1_2_2	MAPK-P_MEK-PP	

Products

Table 85: Properties of each product.

Id	Name	SBO
K_1_1	MAPK-P	
K_2_2	MEK-PP	

Kinetic Law

Derived unit contains undeclared units

$$v_{26} = \text{d9} \cdot K\_K\_1\_1\_2\_2 \qquad (52)$$

Table 86: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
d9			0.6		☑

5.27 Reaction `Reaction27`

This is an irreversible reaction of one reactant forming two products.

Name phosphorylation of MAPK-P

Reaction equation

$$K\_K\_1\_1\_2\_2 \longrightarrow K\_1\_2 + K\_2\_2 \qquad (53)$$

Reactant

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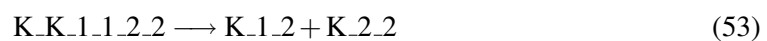
Table 87: Properties of each reactant.

Id	Name	SBO
K_K_1_1_2_2	MAPK-P_MEK-PP	

Products

Table 88: Properties of each product.

Id	Name	SBO
K_1_2	MAPK-PP	
K_2_2	MEK-PP	

Kinetic Law

Derived unit contains undeclared units

$$v_{27} = k9 \cdot K\_K\_1\_1\_2\_2 \tag{54}$$

Table 89: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k9			0.1		☑

5.28 Reaction `Reaction28`

This is an irreversible reaction of two reactants forming one product.

Name binding of MAPK-PP and MAPK phosphatase

Reaction equation

$$MAPKP + K\_1\_2 \longrightarrow K\_MAPKP\_1\_2 \tag{55}$$
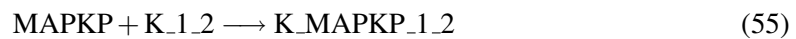
Reactants

Table 90: Properties of each reactant.

Id	Name	SBO
MAPKP	MAPK phosphatase	
K_1_2	MAPK-PP	

Product

Table 91: Properties of each product.

Id	Name	SBO
K_MAPKP_1_2	MAPK-PP_MAPKPase	

Kinetic Law

Derived unit contains undeclared units

$$v_{28} = a10 \cdot MAPKP \cdot K\_1\_2 \tag{56}$$

Table 92: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
a10			5.0		☑

5.29 Reaction `Reaction29`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of MAPK-PP_MAPKPase

Reaction equation

$$K\_MAPKP\_1\_2 \longrightarrow MAPKP + K\_1\_2 \tag{57}$$
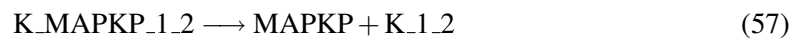
Reactant

Table 93: Properties of each reactant.

Id	Name	SBO
K_MAPKP_1_2	MAPK-PP_MAPKPase	

Products

Table 94: Properties of each product.

Id	Name	SBO
MAPKP	MAPK phosphatase	

Id	Name	SBO
K_1_2	MAPK-PP	

Kinetic Law

Derived unit contains undeclared units

$$v_{29} = \text{d}10 \cdot \text{K\_MAPKP\_1\_2} \tag{58}$$

Table 95: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
d10			0.4		☑

5.30 Reaction `Reaction30`

This is an irreversible reaction of one reactant forming two products.

Name dephosphorylation of MAPK-PP

Reaction equation

$$\text{K\_MAPKP\_1\_2} \longrightarrow \text{MAPKP} + \text{K\_1\_1} \tag{59}$$
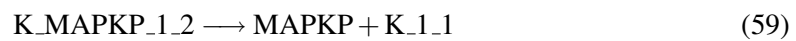
Reactant

Table 96: Properties of each reactant.

Id	Name	SBO
K_MAPKP_1_2	MAPK-PP_MAPKPase	

Products

Table 97: Properties of each product.

Id	Name	SBO
MAPKP	MAPK phosphatase	
K_1_1	MAPK-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{30} = \text{k10} \cdot \text{K\_MAPKP\_1\_2} \tag{60}$$

Table 98: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k10			0.1		☑

5.31 Reaction `Reaction31`

This is an irreversible reaction of two reactants forming one product.

Name binding of MAPK on scaffold

Reaction equation

$$\text{K\_1\_0} + \text{S\_m1\_m1\_m1} \longrightarrow \text{S\_0\_m1\_m1} \tag{61}$$
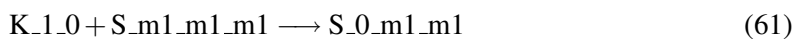
Reactants

Table 99: Properties of each reactant.

Id	Name	SBO
K_1_0	MAPK	
S_m1_m1_m1	Scaffold	

Product

Table 100: Properties of each product.

Id	Name	SBO
S_0_m1_m1	Scaffold_MAPK	

Kinetic Law

Derived unit contains undeclared units

$$v_{31} = \text{kon} \cdot \text{K\_1\_0} \cdot \text{S\_m1\_m1\_m1} \tag{62}$$

Table 101: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kon			10.0		☑

5.32 Reaction `Reaction32`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of MAPK from scaffold

Reaction equation

$$S\_0\_m1\_m1 \longrightarrow K\_1\_0 + S\_m1\_m1\_m1 \tag{63}$$
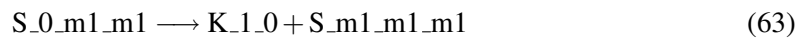
Reactant

Table 102: Properties of each reactant.

Id	Name	SBO
S_0_m1_m1	Scaffold_MAPK	

Products

Table 103: Properties of each product.

Id	Name	SBO
K_1_0	MAPK	
S_m1_m1_m1	Scaffold	

Kinetic Law

Derived unit contains undeclared units

$$v_{32} = \mathrm{koff} \cdot S\_0\_m1\_m1 \tag{64}$$

Table 104: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
koff			0.5		☑

5.33 Reaction `Reaction33`

This is an irreversible reaction of two reactants forming one product.

Name binding of MAPK on scaffold

Reaction equation
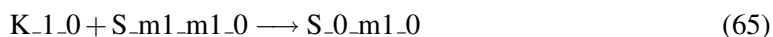
$$K\_1\_0 + S\_m1\_m1\_0 \longrightarrow S\_0\_m1\_0 \tag{65}$$

Reactants

Table 105: Properties of each reactant.

Id	Name	SBO
K_1_0	MAPK	
S_m1_m1_0	Scaffold_RAF	

Product

Table 106: Properties of each product.

Id	Name	SBO
S_0_m1_0	Scaffold_MAPK_RAF	

Kinetic Law

Derived unit contains undeclared units

$$v_{33} = \text{kon} \cdot K\_1\_0 \cdot S\_m1\_m1\_0 \tag{66}$$

Table 107: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kon			10.0		✓

5.34 Reaction `Reaction34`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of MAPK from scaffold

Reaction equation

$$S\_0\_m1\_0 \longrightarrow K\_1\_0 + S\_m1\_m1\_0 \tag{67}$$
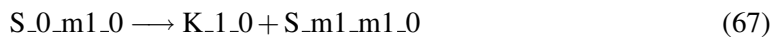
Reactant

Table 108: Properties of each reactant.

Id	Name	SBO
S_0_m1_0	Scaffold_MAPK_RAF	

Products

Table 109: Properties of each product.

Id	Name	SBO
K_1_0	MAPK	
S_m1_m1_0	Scaffold_RAF	

Kinetic Law

Derived unit contains undeclared units

$$v_{34} = \text{koff} \cdot S\_0\_m1\_0 \tag{68}$$

Table 110: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
koff			0.5		☑

5.35 Reaction `Reaction35`

This is an irreversible reaction of two reactants forming one product.

Name binding of MAPK on scaffold

Reaction equation
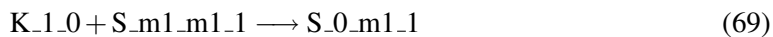
$$K\_1\_0 + S\_m1\_m1\_1 \longrightarrow S\_0\_m1\_1 \tag{69}$$

Reactants

Table 111: Properties of each reactant.

Id	Name	SBO
K_1_0	MAPK	
S_m1_m1_1	Scaffold_RAF-P	

Product

Table 112: Properties of each product.

Id	Name	SBO
S_0_m1_1	Scaffold_MAPK_RAF-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{35} = \text{kon} \cdot \text{K\_1\_0} \cdot \text{S\_m1\_m1\_1} \tag{70}$$

Table 113: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kon			10.0		☑

5.36 Reaction `Reaction36`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of MAPK from scaffold

Reaction equation

$$\text{S\_0\_m1\_1} \longrightarrow \text{K\_1\_0} + \text{S\_m1\_m1\_1} \tag{71}$$
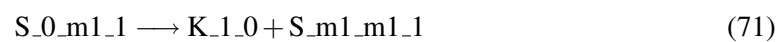
Reactant

Table 114: Properties of each reactant.

Id	Name	SBO
S_0_m1_1	Scaffold_MAPK_RAF-P	

Products

Table 115: Properties of each product.

Id	Name	SBO
K_1_0	MAPK	
S_m1_m1_1	Scaffold_RAF-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{36} = \text{koff} \cdot \text{S\_0\_m1\_1} \tag{72}$$

Table 116: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
koff			0.5		☑

5.37 Reaction `Reaction37`

This is an irreversible reaction of two reactants forming one product.

Name binding of MAPK on scaffold

Reaction equation
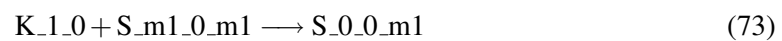
$$\text{K\_1\_0} + \text{S\_m1\_0\_m1} \longrightarrow \text{S\_0\_0\_m1} \tag{73}$$

Reactants

Table 117: Properties of each reactant.

Id	Name	SBO
K_1_0	MAPK	
S_m1_0_m1	Scaffold_MEK	

Product

Table 118: Properties of each product.

Id	Name	SBO
S_0_0_m1	Scaffold_MAPK_MEK	

Kinetic Law

Derived unit contains undeclared units

$$v_{37} = \text{kon} \cdot \text{K\_1\_0} \cdot \text{S\_m1\_0\_m1} \tag{74}$$

Table 119: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kon			10.0		☑

5.38 Reaction `Reaction38`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of MAPK from scaffold

Reaction equation

$$\text{S\_0\_0\_m1} \longrightarrow \text{K\_1\_0} + \text{S\_m1\_0\_m1} \tag{75}$$
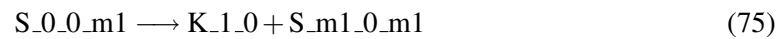
Reactant

Table 120: Properties of each reactant.

Id	Name	SBO
S_0_0_m1	Scaffold_MAPK_MEK	

Products

Table 121: Properties of each product.

Id	Name	SBO
K_1_0	MAPK	
S_m1_0_m1	Scaffold_MEK	

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Kinetic Law

Derived unit contains undeclared units

$$v_{38} = \text{koff} \cdot \text{S\_0\_0\_m1} \tag{76}$$

Table 122: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
koff			0.5		☑

5.39 Reaction `Reaction39`

This is an irreversible reaction of two reactants forming one product.

Name binding of MAPK on scaffold

Reaction equation

$$\text{K\_1\_0} + \text{S\_m1\_0\_0} \longrightarrow \text{S\_0\_0\_0} \tag{77}$$
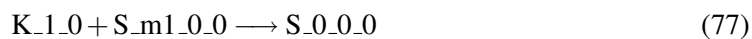
Reactants

Table 123: Properties of each reactant.

Id	Name	SBO
K_1_0	MAPK	
S_m1_0_0	Scaffold_MEK_RAF	

Product

Table 124: Properties of each product.

Id	Name	SBO
S_0_0_0	Scaffold_MAPK_MEK_RAF	

Kinetic Law

Derived unit contains undeclared units

$$v_{39} = \text{kon} \cdot \text{K\_1\_0} \cdot \text{S\_m1\_0\_0} \tag{78}$$

Table 125: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kon			10.0		☑

5.40 Reaction `Reaction40`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of MAPK from scaffold

Reaction equation

$$S\_0\_0\_0 \longrightarrow K\_1\_0 + S\_m1\_0\_0 \tag{79}$$
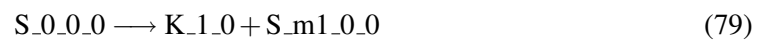
Reactant

Table 126: Properties of each reactant.

Id	Name	SBO
S_0_0_0	Scaffold_MAPK_MEK_RAF	

Products

Table 127: Properties of each product.

Id	Name	SBO
K_1_0	MAPK	
S_m1_0_0	Scaffold_MEK_RAF	

Kinetic Law

Derived unit contains undeclared units

$$v_{40} = \text{koff} \cdot S\_0\_0\_0 \tag{80}$$

Table 128: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
koff			0.5		☑

5.41 Reaction Reaction41

This is an irreversible reaction of two reactants forming one product.

Name binding of MAPK on scaffold

Reaction equation

$$K\_1\_0 + S\_m1\_0\_1 \longrightarrow S\_0\_0\_1 \tag{81}$$

Reactants

Table 129: Properties of each reactant.

Id	Name	SBO
K_1_0	MAPK	
S_m1_0_1	Scaffold_MEK_RAF-P	

Product

Table 130: Properties of each product.

Id	Name	SBO
S_0_0_1	Scaffold_MAPK_MEK_RAF-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{41} = \text{kon} \cdot K\_1\_0 \cdot S\_m1\_0\_1 \tag{82}$$

Table 131: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kon			10.0		✓

5.42 Reaction Reaction42

This is an irreversible reaction of one reactant forming two products.

Name dissociation of MAPK from scaffold

Reaction equation

$$\text{S\_0\_0\_1} \longrightarrow \text{K\_1\_0} + \text{S\_m1\_0\_1} \tag{83}$$
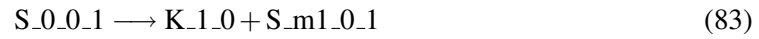
Reactant

Table 132: Properties of each reactant.

Id	Name	SBO
S_0_0_1	Scaffold_MAPK_MEK_RAF-P	

Products

Table 133: Properties of each product.

Id	Name	SBO
K_1_0	MAPK	
S_m1_0_1	Scaffold_MEK_RAF-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{42} = \text{koff} \cdot \text{S\_0\_0\_1} \tag{84}$$

Table 134: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
koff			0.5		☑

5.43 Reaction `Reaction43`

This is an irreversible reaction of two reactants forming one product.

Name binding of MAPK on scaffold

Reaction equation

$$\text{K\_1\_0} + \text{S\_m1\_1\_m1} \longrightarrow \text{S\_0\_1\_m1} \tag{85}$$

Reactants

Table 135: Properties of each reactant.

Id	Name	SBO
K_1_0	MAPK	
S_m1_1_m1	Scaffold_MEK-P	

Product

Table 136: Properties of each product.

Id	Name	SBO
S_0_1_m1	Scaffold_MAPK_MEK-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{43} = \text{kon} \cdot \text{K\_1\_0} \cdot \text{S\_m1\_1\_m1} \tag{86}$$

Table 137: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kon			10.0		☑

5.44 Reaction `Reaction44`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of MAPK from scaffold

Reaction equation

$$\text{S\_0\_1\_m1} \longrightarrow \text{K\_1\_0} + \text{S\_m1\_1\_m1} \tag{87}$$
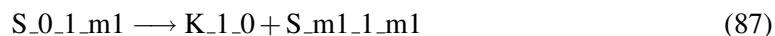
Reactant

Table 138: Properties of each reactant.

Id	Name	SBO
S_0_1_m1	Scaffold_MAPK_MEK-P	

Products

<div align="center">

Table 139: Properties of each product.

Id	Name	SBO
K_1_0	MAPK	
S_m1_1_m1	Scaffold_MEK-P	

</div>

Kinetic Law

Derived unit contains undeclared units

$$v_{44} = \text{koff} \cdot \text{S\_0\_1\_m1} \tag{88}$$

<div align="center">

Table 140: Properties of each parameter.

</div>

Id	Name	SBO	Value	Unit	Constant
koff			0.5		☑

5.45 Reaction `Reaction45`

This is an irreversible reaction of two reactants forming one product.

Name binding of MAPK on scaffold

Reaction equation

$$\text{K\_1\_0} + \text{S\_m1\_1\_0} \longrightarrow \text{S\_0\_1\_0} \tag{89}$$
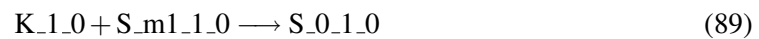
Reactants

<div align="center">

Table 141: Properties of each reactant.

Id	Name	SBO
K_1_0	MAPK	
S_m1_1_0	Scaffold_MEK-P_RAF	

</div>

Product

Table 142: Properties of each product.

Id	Name	SBO
S_0_1_0	Scaffold_MAPK_MEK-P_RAF	

Kinetic Law

Derived unit contains undeclared units

$$v_{45} = \text{kon} \cdot \text{K\_1\_0} \cdot \text{S\_m1\_1\_0} \tag{90}$$

Table 143: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kon			10.0		☑

5.46 Reaction `Reaction46`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of MAPK from scaffold

Reaction equation

$$\text{S\_0\_1\_0} \longrightarrow \text{K\_1\_0} + \text{S\_m1\_1\_0} \tag{91}$$
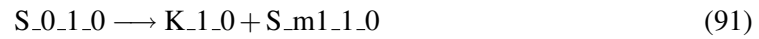
Reactant

Table 144: Properties of each reactant.

Id	Name	SBO
S_0_1_0	Scaffold_MAPK_MEK-P_RAF	

Products

Table 145: Properties of each product.

Id	Name	SBO
K_1_0	MAPK	
S_m1_1_0	Scaffold_MEK-P_RAF	

Kinetic Law

Derived unit contains undeclared units

$$v_{46} = \text{koff} \cdot \text{S\_0\_1\_0} \tag{92}$$

Table 146: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
koff			0.5		☑

5.47 Reaction `Reaction47`

This is an irreversible reaction of two reactants forming one product.

Name binding of MAPK on scaffold

Reaction equation

$$\text{K\_1\_0} + \text{S\_m1\_1\_1} \longrightarrow \text{S\_0\_1\_1} \tag{93}$$
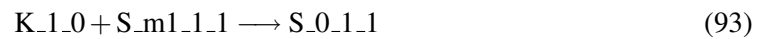
Reactants

Table 147: Properties of each reactant.

Id	Name	SBO
K_1_0	MAPK	
S_m1_1_1	Scaffold_MEK-P_RAF-P	

Product

Table 148: Properties of each product.

Id	Name	SBO
S_0_1_1	Scaffold_MAPK_MEK-P_RAF-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{47} = \text{kon} \cdot \text{K\_1\_0} \cdot \text{S\_m1\_1\_1} \tag{94}$$
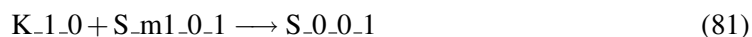
Table 149: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kon			10.0		☑

5.48 Reaction `Reaction48`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of MAPK from scaffold

Reaction equation

$$S\_0\_1\_1 \longrightarrow K\_1\_0 + S\_m1\_1\_1 \tag{95}$$
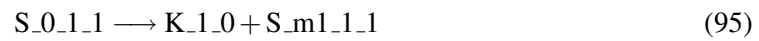
Reactant

Table 150: Properties of each reactant.

Id	Name	SBO
S_0_1_1	Scaffold_MAPK_MEK-P_RAF-P	

Products

Table 151: Properties of each product.

Id	Name	SBO
K_1_0	MAPK	
S_m1_1_1	Scaffold_MEK-P_RAF-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{48} = \text{koff} \cdot S\_0\_1\_1 \tag{96}$$

Table 152: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
koff			0.5		☑

5.49 Reaction `Reaction49`

This is an irreversible reaction of two reactants forming one product.

Name binding of MAPK on scaffold

Reaction equation
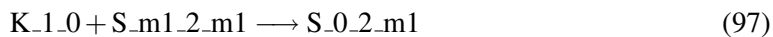
$$K\_1\_0 + S\_m1\_2\_m1 \longrightarrow S\_0\_2\_m1 \tag{97}$$

Reactants

Table 153: Properties of each reactant.

Id	Name	SBO
K_1_0	MAPK	
S_m1_2_m1	Scaffold_MEK-PP	

Product

Table 154: Properties of each product.

Id	Name	SBO
S_0_2_m1	Scaffold_MAPK_MEK-PP	

Kinetic Law

Derived unit contains undeclared units

$$v_{49} = \text{kon} \cdot K\_1\_0 \cdot S\_m1\_2\_m1 \tag{98}$$

Table 155: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kon			10.0		✓

5.50 Reaction `Reaction50`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of MAPK from scaffold

Reaction equation

$$\text{S\_0\_2\_m1} \longrightarrow \text{K\_1\_0} + \text{S\_m1\_2\_m1} \tag{99}$$

Reactant

Table 156: Properties of each reactant.

Id	Name	SBO
S_0_2_m1	Scaffold_MAPK_MEK-PP	

Products

Table 157: Properties of each product.

Id	Name	SBO
K_1_0	MAPK	
S_m1_2_m1	Scaffold_MEK-PP	

Kinetic Law

Derived unit contains undeclared units

$$v_{50} = \text{koff} \cdot \text{S\_0\_2\_m1} \tag{100}$$

Table 158: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
koff			0.5		☑

5.51 Reaction `Reaction51`

This is an irreversible reaction of two reactants forming one product.

Name binding of MAPK on scaffold

Reaction equation

$$\text{K\_1\_0} + \text{S\_m1\_2\_0} \longrightarrow \text{S\_0\_2\_0} \tag{101}$$
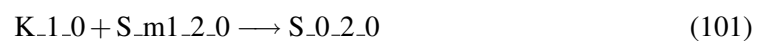
Reactants

Table 159: Properties of each reactant.

Id	Name	SBO
K_1_0	MAPK	
S_m1_2_0	Scaffold_MEK-PP_RAF	

Product

Table 160: Properties of each product.

Id	Name	SBO
S_0_2_0	Scaffold_MAPK_MEK-PP_RAF	

Kinetic Law

Derived unit contains undeclared units

$$v_{51} = \text{kon} \cdot \text{K\_1\_0} \cdot \text{S\_m1\_2\_0} \tag{102}$$

Table 161: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kon			10.0		☑

5.52 Reaction `Reaction52`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of MAPK from scaffold

Reaction equation

$$S\_0\_2\_0 \longrightarrow K\_1\_0 + S\_m1\_2\_0 \tag{103}$$
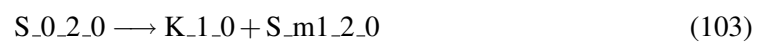
Reactant

Table 162: Properties of each reactant.

Id	Name	SBO
S_0_2_0	Scaffold_MAPK_MEK-PP_RAF	

Products

Table 163: Properties of each product.

Id	Name	SBO
K_1_0	MAPK	
S_m1_2_0	Scaffold_MEK-PP_RAF	

Kinetic Law

Derived unit contains undeclared units

$$v_{52} = \text{koff} \cdot \text{S\_0\_2\_0} \tag{104}$$

Table 164: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
koff			0.5		☑

5.53 Reaction `Reaction53`

This is an irreversible reaction of two reactants forming one product.

Name binding of MAPK on scaffold

Reaction equation

$$\text{K\_1\_0} + \text{S\_m1\_2\_1} \longrightarrow \text{S\_0\_2\_1} \tag{105}$$
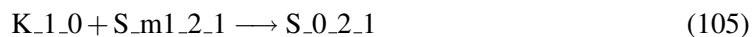
Reactants

Table 165: Properties of each reactant.

Id	Name	SBO
K_1_0	MAPK	
S_m1_2_1	Scaffold_MEK-PP_RAF-P	

Product

Table 166: Properties of each product.

Id	Name	SBO
S_0_2_1	Scaffold_MAPK_MEK-PP_RAF-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{53} = \text{kon} \cdot \text{K\_1\_0} \cdot \text{S\_m1\_2\_1} \qquad (106)$$

Table 167: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kon			10.0		☑

5.54 Reaction `Reaction54`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of MAPK from scaffold

Reaction equation

$$\text{S\_0\_2\_1} \longrightarrow \text{K\_1\_0} + \text{S\_m1\_2\_1} \qquad (107)$$
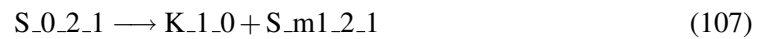
Reactant

Table 168: Properties of each reactant.

Id	Name	SBO
S_0_2_1	Scaffold_MAPK_MEK-PP_RAF-P	

Products

Table 169: Properties of each product.

Id	Name	SBO
K_1_0	MAPK	
S_m1_2_1	Scaffold_MEK-PP_RAF-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{54} = \text{koff} \cdot \text{S\_0\_2\_1} \tag{108}$$

Table 170: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
koff			0.5		☑

5.55 Reaction `Reaction55`

This is an irreversible reaction of two reactants forming one product.

Name binding of MAPK-P on scaffold

Reaction equation

$$\text{K\_1\_1} + \text{S\_m1\_m1\_m1} \longrightarrow \text{S\_1\_m1\_m1} \tag{109}$$
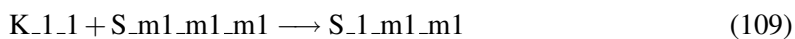
Reactants

Table 171: Properties of each reactant.

Id	Name	SBO
K_1_1	MAPK-P	
S_m1_m1_m1	Scaffold	

Product

Table 172: Properties of each product.

Id	Name	SBO
S_1_m1_m1	Scaffold_MAPK-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{55} = \text{kpon} \cdot \text{K\_1\_1} \cdot \text{S\_m1\_m1\_m1} \tag{110}$$

Table 173: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpon			0.0		☑

5.56 Reaction `Reaction56`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of MAPK-P from scaffold

Reaction equation

$$S\_1\_m1\_m1 \longrightarrow K\_1\_1 + S\_m1\_m1\_m1 \qquad (111)$$
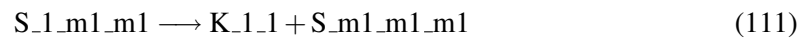
Reactant

Table 174: Properties of each reactant.

Id	Name	SBO
S_1_m1_m1	Scaffold_MAPK-P	

Products

Table 175: Properties of each product.

Id	Name	SBO
K_1_1	MAPK-P	
S_m1_m1_m1	Scaffold	

Kinetic Law

Derived unit contains undeclared units

$$v_{56} = \text{kpoff} \cdot S\_1\_m1\_m1 \qquad (112)$$
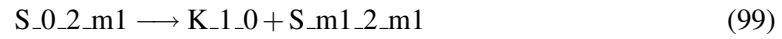
Table 176: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpoff			0.05		☑

5.57 Reaction `Reaction57`

This is an irreversible reaction of two reactants forming one product.

Name binding of MAPK-P on scaffold

Reaction equation

$$K\_1\_1 + S\_m1\_m1\_0 \longrightarrow S\_1\_m1\_0 \tag{113}$$
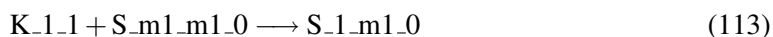
Reactants

Table 177: Properties of each reactant.

Id	Name	SBO
K_1_1	MAPK-P	
S_m1_m1_0	Scaffold_RAF	

Product

Table 178: Properties of each product.

Id	Name	SBO
S_1_m1_0	Scaffold_MAPK-P_RAF	

Kinetic Law

Derived unit contains undeclared units

$$v_{57} = \text{kpon} \cdot K\_1\_1 \cdot S\_m1\_m1\_0 \tag{114}$$

Table 179: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpon			0.0		✓

5.58 Reaction `Reaction58`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of MAPK-P from scaffold

Reaction equation

$$S\_1\_m1\_0 \longrightarrow K\_1\_1 + S\_m1\_m1\_0 \tag{115}$$
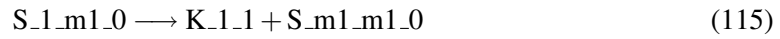
Reactant

Table 180: Properties of each reactant.

Id	Name	SBO
S_1_m1_0	Scaffold_MAPK-P_RAF	

Products

Table 181: Properties of each product.

Id	Name	SBO
K_1_1	MAPK-P	
S_m1_m1_0	Scaffold_RAF	

Kinetic Law

Derived unit contains undeclared units

$$v_{58} = \text{kpoff} \cdot S\_1\_m1\_0 \tag{116}$$

Table 182: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpoff			0.05		☑

5.59 Reaction `Reaction59`

This is an irreversible reaction of two reactants forming one product.

Name binding of MAPK-P on scaffold

Reaction equation

$$K\_1\_1 + S\_m1\_m1\_1 \longrightarrow S\_1\_m1\_1 \tag{117}$$

Reactants

Produced by SBML2LATEX
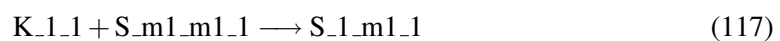
Table 183: Properties of each reactant.

Id	Name	SBO
K_1_1	MAPK-P	
S_m1_m1_1	Scaffold_RAF-P	

Product

Table 184: Properties of each product.

Id	Name	SBO
S_1_m1_1	Scaffold_MAPK-P_RAF-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{59} = \text{kpon} \cdot \text{K\_1\_1} \cdot \text{S\_m1\_m1\_1} \tag{118}$$

Table 185: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpon			0.0		☑

5.60 Reaction `Reaction60`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of MAPK-P from scaffold

Reaction equation

$$\text{S\_1\_m1\_1} \longrightarrow \text{K\_1\_1} + \text{S\_m1\_m1\_1} \tag{119}$$
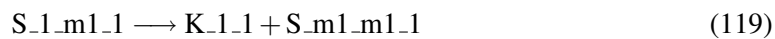
Reactant

Table 186: Properties of each reactant.

Id	Name	SBO
S_1_m1_1	Scaffold_MAPK-P_RAF-P	

Products

Table 187: Properties of each product.

Id	Name	SBO
K_1_1	MAPK-P	
S_m1_m1_1	Scaffold_RAF-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{60} = \text{kpoff} \cdot \text{S\_1\_m1\_1} \tag{120}$$

Table 188: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpoff			0.05		☑

5.61 Reaction `Reaction61`

This is an irreversible reaction of two reactants forming one product.

Name binding of MAPK-P on scaffold

Reaction equation

$$\text{K\_1\_1} + \text{S\_m1\_0\_m1} \longrightarrow \text{S\_1\_0\_m1} \tag{121}$$
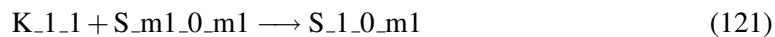
Reactants

Table 189: Properties of each reactant.

Id	Name	SBO
K_1_1	MAPK-P	
S_m1_0_m1	Scaffold_MEK	

Product

Table 190: Properties of each product.

Id	Name	SBO
S_1_0_m1	Scaffold_MAPK-P_MEK	

Kinetic Law

Derived unit contains undeclared units

$$v_{61} = \text{kpon} \cdot \text{K\_1\_1} \cdot \text{S\_m1\_0\_m1} \tag{122}$$

Table 191: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpon			0.0		✓

5.62 Reaction `Reaction62`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of MAPK-P from scaffold

Reaction equation

$$\text{S\_1\_0\_m1} \longrightarrow \text{K\_1\_1} + \text{S\_m1\_0\_m1} \tag{123}$$
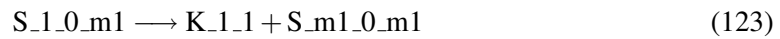
Reactant

Table 192: Properties of each reactant.

Id	Name	SBO
S_1_0_m1	Scaffold_MAPK-P_MEK	

Products

Table 193: Properties of each product.

Id	Name	SBO
K_1_1	MAPK-P	
S_m1_0_m1	Scaffold_MEK	

Kinetic Law

Derived unit contains undeclared units

$$v_{62} = \text{kpoff} \cdot \text{S\_1\_0\_m1} \tag{124}$$

Table 194: Properties of each parameter.

| Id	Name	SBO	Value	Unit	Constant
kpoff			0.05		☑

5.63 Reaction `Reaction63`

This is an irreversible reaction of two reactants forming one product.

Name binding of MAPK-P on scaffold

Reaction equation

$$\text{K\_1\_1} + \text{S\_m1\_0\_0} \longrightarrow \text{S\_1\_0\_0} \tag{125}$$
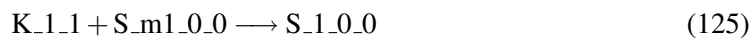
Reactants

Table 195: Properties of each reactant.

Id	Name	SBO
K_1_1	MAPK-P	
S_m1_0_0	Scaffold_MEK_RAF	

Product

Table 196: Properties of each product.

Id	Name	SBO
S_1_0_0	Scaffold_MAPK-P_MEK_RAF	

Kinetic Law

Derived unit contains undeclared units

$$v_{63} = \text{kpon} \cdot \text{K\_1\_1} \cdot \text{S\_m1\_0\_0} \tag{126}$$

Table 197: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpon			0.0		☑

5.64 Reaction `Reaction64`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of MAPK-P from scaffold

Reaction equation

$$S\_1\_0\_0 \longrightarrow K\_1\_1 + S\_m1\_0\_0 \qquad (127)$$
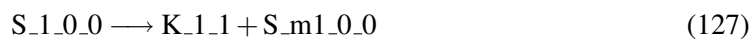
Reactant

Table 198: Properties of each reactant.

Id	Name	SBO
S_1_0_0	Scaffold_MAPK-P_MEK_RAF	

Products

Table 199: Properties of each product.

Id	Name	SBO
K_1_1	MAPK-P	
S_m1_0_0	Scaffold_MEK_RAF	

Kinetic Law

Derived unit contains undeclared units

$$v_{64} = \text{kpoff} \cdot S\_1\_0\_0 \qquad (128)$$

Table 200: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpoff			0.05		☑

5.65 Reaction `Reaction65`

This is an irreversible reaction of two reactants forming one product.

Name binding of MAPK-P on scaffold

Reaction equation

$$K\_1\_1 + S\_m1\_0\_1 \longrightarrow S\_1\_0\_1 \tag{129}$$
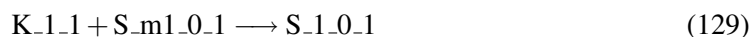
Reactants

Table 201: Properties of each reactant.

Id	Name	SBO
K_1_1	MAPK-P	
S_m1_0_1	Scaffold_MEK_RAF-P	

Product

Table 202: Properties of each product.

Id	Name	SBO
S_1_0_1	Scaffold_MAPK-P_MEK_RAF-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{65} = \text{kpon} \cdot K\_1\_1 \cdot S\_m1\_0\_1 \tag{130}$$

Table 203: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpon			0.0		☑

5.66 Reaction `Reaction66`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of MAPK-P from scaffold

Reaction equation

$$S\_1\_0\_1 \longrightarrow K\_1\_1 + S\_m1\_0\_1 \qquad (131)$$
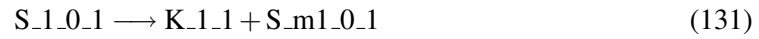
Reactant

Table 204: Properties of each reactant.

Id	Name	SBO
S_1_0_1	Scaffold_MAPK-P_MEK_RAF-P	

Products

Table 205: Properties of each product.

Id	Name	SBO
K_1_1	MAPK-P	
S_m1_0_1	Scaffold_MEK_RAF-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{66} = \text{kpoff} \cdot S\_1\_0\_1 \qquad (132)$$

Table 206: Properties of each parameter.

| Id	Name	SBO	Value	Unit	Constant
kpoff			0.05		☑

5.67 Reaction `Reaction67`

This is an irreversible reaction of two reactants forming one product.

Name binding of MAPK-P on scaffold

Reaction equation

$$K\_1\_1 + S\_m1\_1\_m1 \longrightarrow S\_1\_1\_m1 \qquad (133)$$
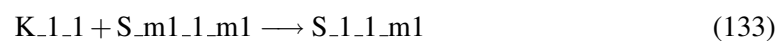
Reactants

Table 207: Properties of each reactant.

Id	Name	SBO
K_1_1	MAPK-P	
S_m1_1_m1	Scaffold_MEK-P	

Product

Table 208: Properties of each product.

Id	Name	SBO
S_1_1_m1	Scaffold_MAPK-P_MEK-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{67} = \text{kpon} \cdot \text{K\_1\_1} \cdot \text{S\_m1\_1\_m1} \tag{134}$$

Table 209: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpon			0.0		✓

5.68 Reaction `Reaction68`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of MAPK-P from scaffold

Reaction equation

$$\text{S\_1\_1\_m1} \longrightarrow \text{K\_1\_1} + \text{S\_m1\_1\_m1} \tag{135}$$
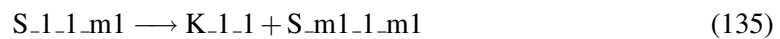
Reactant

Table 210: Properties of each reactant.

Id	Name	SBO
S_1_1_m1	Scaffold_MAPK-P_MEK-P	

Products

Table 211: Properties of each product.

Id	Name	SBO
K_1_1	MAPK-P	
S_m1_1_m1	Scaffold_MEK-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{68} = \text{kpoff} \cdot \text{S\_1\_1\_m1} \tag{136}$$

Table 212: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpoff			0.05		✓

5.69 Reaction `Reaction69`

This is an irreversible reaction of two reactants forming one product.

Name binding of MAPK-P on scaffold

Reaction equation

$$\text{K\_1\_1} + \text{S\_m1\_1\_0} \longrightarrow \text{S\_1\_1\_0} \tag{137}$$
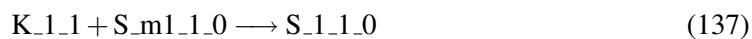
Reactants

Table 213: Properties of each reactant.

Id	Name	SBO
K_1_1	MAPK-P	
S_m1_1_0	Scaffold_MEK-P_RAF	

Product

Table 214: Properties of each product.

Id	Name	SBO
S_1_1_0	Scaffold_MAPK-P_MEK-P_RAF	

Kinetic Law

Derived unit contains undeclared units

$$v_{69} = \text{kpon} \cdot \text{K\_1\_1} \cdot \text{S\_m1\_1\_0} \tag{138}$$

Table 215: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpon			0.0		☑

5.70 Reaction `Reaction70`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of MAPK-P from scaffold

Reaction equation

$$\text{S\_1\_1\_0} \longrightarrow \text{K\_1\_1} + \text{S\_m1\_1\_0} \tag{139}$$
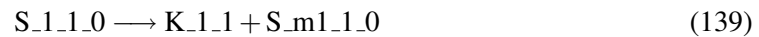
Reactant

Table 216: Properties of each reactant.

Id	Name	SBO
S_1_1_0	Scaffold_MAPK-P_MEK-P_RAF	

Products

Table 217: Properties of each product.

Id	Name	SBO
K_1_1	MAPK-P	
S_m1_1_0	Scaffold_MEK-P_RAF	

Kinetic Law

Derived unit contains undeclared units

$$v_{70} = \text{kpoff} \cdot \text{S\_1\_1\_0} \tag{140}$$

Table 218: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpoff			0.05		☑

5.71 Reaction `Reaction71`

This is an irreversible reaction of two reactants forming one product.

Name binding of MAPK-P on scaffold

Reaction equation

$$\text{K\_1\_1} + \text{S\_m1\_1\_1} \longrightarrow \text{S\_1\_1\_1} \tag{141}$$
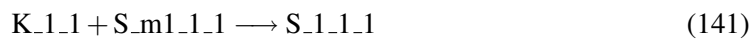
Reactants

Table 219: Properties of each reactant.

Id	Name	SBO
K_1_1	MAPK-P	
S_m1_1_1	Scaffold_MEK-P_RAF-P	

Product

Table 220: Properties of each product.

Id	Name	SBO
S_1_1_1	Scaffold_MAPK-P_MEK-P_RAF-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{71} = \text{kpon} \cdot \text{K\_1\_1} \cdot \text{S\_m1\_1\_1} \tag{142}$$

Table 221: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpon			0.0		☑

5.72 Reaction `Reaction72`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of MAPK-P from scaffold

Reaction equation

$$S\_1\_1\_1 \longrightarrow K\_1\_1 + S\_m1\_1\_1 \tag{143}$$
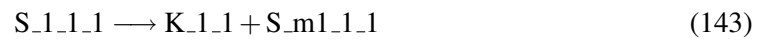
Reactant

Table 222: Properties of each reactant.

Id	Name	SBO
S_1_1_1	Scaffold_MAPK-P_MEK-P_RAF-P	

Products

Table 223: Properties of each product.

Id	Name	SBO
K_1_1	MAPK-P	
S_m1_1_1	Scaffold_MEK-P_RAF-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{72} = \text{kpoff} \cdot S\_1\_1\_1 \tag{144}$$

Table 224: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpoff			0.05		☑

5.73 Reaction `Reaction73`

This is an irreversible reaction of two reactants forming one product.

Name binding of MAPK-P on scaffold

Reaction equation

$$K\_1\_1 + S\_m1\_2\_m1 \longrightarrow S\_1\_2\_m1 \tag{145}$$
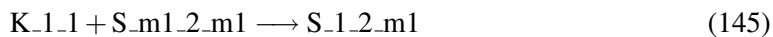
Reactants

Table 225: Properties of each reactant.

Id	Name	SBO
K_1_1	MAPK-P	
S_m1_2_m1	Scaffold_MEK-PP	

Product

Table 226: Properties of each product.

Id	Name	SBO
S_1_2_m1	Scaffold_MAPK-P_MEK-PP	

Kinetic Law

Derived unit contains undeclared units

$$v_{73} = \text{kpon} \cdot K\_1\_1 \cdot S\_m1\_2\_m1 \tag{146}$$

Table 227: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpon			0.0		☑

5.74 Reaction `Reaction74`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of MAPK-P from scaffold

Reaction equation

$$S\_1\_2\_m1 \longrightarrow K\_1\_1 + S\_m1\_2\_m1 \qquad (147)$$
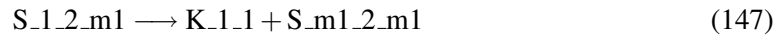
Reactant

Table 228: Properties of each reactant.

Id	Name	SBO
S_1_2_m1	Scaffold_MAPK-P_MEK-PP	

Products

Table 229: Properties of each product.

Id	Name	SBO
K_1_1	MAPK-P	
S_m1_2_m1	Scaffold_MEK-PP	

Kinetic Law

Derived unit contains undeclared units

$$v_{74} = \text{kpoff} \cdot S\_1\_2\_m1 \qquad (148)$$

Table 230: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpoff			0.05		☑

5.75 Reaction `Reaction75`

This is an irreversible reaction of two reactants forming one product.

Name binding of MAPK-P on scaffold

Reaction equation

$$K\_1\_1 + S\_m1\_2\_0 \longrightarrow S\_1\_2\_0 \qquad (149)$$
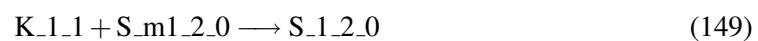
Reactants

Id	Name	SBO
K_1_1	MAPK-P	
S_m1_2_0	Scaffold_MEK-PP_RAF	

Product

Table 232: Properties of each product.

Id	Name	SBO
S_1_2_0	Scaffold_MAPK-P_MEK-PP_RAF	

Kinetic Law

Derived unit contains undeclared units

$$v_{75} = \text{kpon} \cdot \text{K\_1\_1} \cdot \text{S\_m1\_2\_0} \tag{150}$$

Table 233: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpon			0.0		☑

5.76 Reaction `Reaction76`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of MAPK-P from scaffold

Reaction equation

$$\text{S\_1\_2\_0} \longrightarrow \text{K\_1\_1} + \text{S\_m1\_2\_0} \tag{151}$$
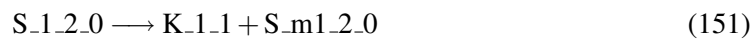
Reactant

Table 234: Properties of each reactant.

Id	Name	SBO
S_1_2_0	Scaffold_MAPK-P_MEK-PP_RAF	

Products

<div align="center">

Table 235: Properties of each product.

Id	Name	SBO
K_1_1	MAPK-P	
S_m1_2_0	Scaffold_MEK-PP_RAF	

</div>

Kinetic Law

Derived unit contains undeclared units

$$v_{76} = \text{kpoff} \cdot \text{S\_1\_2\_0} \tag{152}$$

<div align="center">

Table 236: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpoff			0.05		☑

</div>

5.77 Reaction `Reaction77`

This is an irreversible reaction of two reactants forming one product.

Name binding of MAPK-P on scaffold

Reaction equation

$$\text{K\_1\_1} + \text{S\_m1\_2\_1} \longrightarrow \text{S\_1\_2\_1} \tag{153}$$
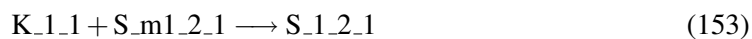
Reactants

<div align="center">

Table 237: Properties of each reactant.

Id	Name	SBO
K_1_1	MAPK-P	
S_m1_2_1	Scaffold_MEK-PP_RAF-P	

</div>

Product

Table 238: Properties of each product.

Id	Name	SBO
S_1_2_1	Scaffold_MAPK-P_MEK-PP_RAF-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{77} = \text{kpon} \cdot \text{K\_1\_1} \cdot \text{S\_m1\_2\_1} \tag{154}$$

Table 239: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpon			0.0		☑

5.78 Reaction `Reaction78`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of MAPK-P from scaffold

Reaction equation

$$\text{S\_1\_2\_1} \longrightarrow \text{K\_1\_1} + \text{S\_m1\_2\_1} \tag{155}$$
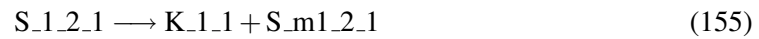
Reactant

Table 240: Properties of each reactant.

Id	Name	SBO
S_1_2_1	Scaffold_MAPK-P_MEK-PP_RAF-P	

Products

Table 241: Properties of each product.

Id	Name	SBO
K_1_1	MAPK-P	
S_m1_2_1	Scaffold_MEK-PP_RAF-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{78} = \text{kpoff} \cdot \text{S\_1\_2\_1} \tag{156}$$

Table 242: Properties of each parameter.

| Id	Name	SBO	Value	Unit	Constant
kpoff			0.05		☑

5.79 Reaction `Reaction79`

This is an irreversible reaction of two reactants forming one product.

Name binding of MAPK-PP on scaffold

Reaction equation

$$\text{K\_1\_2} + \text{S\_m1\_m1\_m1} \longrightarrow \text{S\_2\_m1\_m1} \tag{157}$$
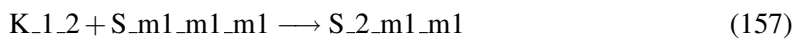
Reactants

Table 243: Properties of each reactant.

Id	Name	SBO
K_1_2	MAPK-PP	
S_m1_m1_m1	Scaffold	

Product

Table 244: Properties of each product.

Id	Name	SBO
S_2_m1_m1	Scaffold_MAPK-PP	

Kinetic Law

Derived unit contains undeclared units

$$v_{79} = \text{kpon} \cdot \text{K\_1\_2} \cdot \text{S\_m1\_m1\_m1} \tag{158}$$

Table 245: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpon			0.0		☑

5.80 Reaction `Reaction80`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of MAPK-PP from scaffold

Reaction equation

$$S\_2\_m1\_m1 \longrightarrow K\_1\_2 + S\_m1\_m1\_m1 \tag{159}$$
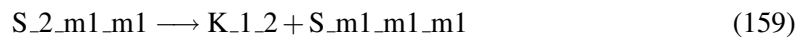
Reactant

Table 246: Properties of each reactant.

Id	Name	SBO
S_2_m1_m1	Scaffold_MAPK-PP	

Products

Table 247: Properties of each product.

Id	Name	SBO
K_1_2	MAPK-PP	
S_m1_m1_m1	Scaffold	

Kinetic Law

Derived unit contains undeclared units

$$v_{80} = \text{kpoff} \cdot S\_2\_m1\_m1 \tag{160}$$

Table 248: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpoff			0.05		☑

5.81 Reaction `Reaction81`

This is an irreversible reaction of two reactants forming one product.

Name binding of MAPK-PP on scaffold

Reaction equation

$$K\_1\_2 + S\_m1\_m1\_0 \longrightarrow S\_2\_m1\_0 \tag{161}$$
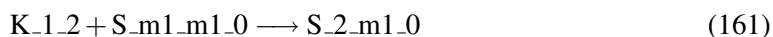
Reactants

Table 249: Properties of each reactant.

Id	Name	SBO
K_1_2	MAPK-PP	
S_m1_m1_0	Scaffold_RAF	

Product

Table 250: Properties of each product.

Id	Name	SBO
S_2_m1_0	Scaffold_MAPK-PP_RAF	

Kinetic Law

Derived unit contains undeclared units

$$v_{81} = \text{kpon} \cdot K\_1\_2 \cdot S\_m1\_m1\_0 \tag{162}$$

Table 251: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpon			0.0		☑

5.82 Reaction `Reaction82`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of MAPK-PP from scaffold

Reaction equation

$$S\_2\_m1\_0 \longrightarrow K\_1\_2 + S\_m1\_m1\_0 \tag{163}$$
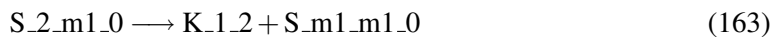
Reactant

Table 252: Properties of each reactant.

Id	Name	SBO
S_2_m1_0	Scaffold_MAPK-PP_RAF	

Products

Table 253: Properties of each product.

Id	Name	SBO
K_1_2	MAPK-PP	
S_m1_m1_0	Scaffold_RAF	

Kinetic Law

Derived unit contains undeclared units

$$v_{82} = \text{kpoff} \cdot S\_2\_m1\_0 \tag{164}$$

Table 254: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpoff			0.05		✔

5.83 Reaction `Reaction83`

This is an irreversible reaction of two reactants forming one product.

Name binding of MAPK-PP on scaffold

Reaction equation

$$K\_1\_2 + S\_m1\_m1\_1 \longrightarrow S\_2\_m1\_1 \tag{165}$$
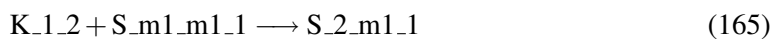
Reactants

Table 255: Properties of each reactant.

Id	Name	SBO
K_1_2	MAPK-PP	
S_m1_m1_1	Scaffold_RAF-P	

Product

Table 256: Properties of each product.

Id	Name	SBO
S_2_m1_1	Scaffold_MAPK-PP_RAF-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{83} = \text{kpon} \cdot \text{K\_1\_2} \cdot \text{S\_m1\_m1\_1} \tag{166}$$

Table 257: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpon			0.0		☑

5.84 Reaction `Reaction84`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of MAPK-PP from scaffold

Reaction equation

$$\text{S\_2\_m1\_1} \longrightarrow \text{K\_1\_2} + \text{S\_m1\_m1\_1} \tag{167}$$
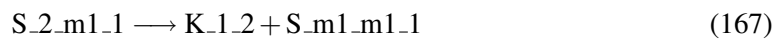
Reactant

Table 258: Properties of each reactant.

Id	Name	SBO
S_2_m1_1	Scaffold_MAPK-PP_RAF-P	

Products

Table 259: Properties of each product.

Id	Name	SBO
K_1_2	MAPK-PP	
S_m1_m1_1	Scaffold_RAF-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{84} = \text{kpoff} \cdot \text{S\_2\_m1\_1} \tag{168}$$

Table 260: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpoff			0.05		☑

5.85 Reaction `Reaction85`

This is an irreversible reaction of two reactants forming one product.

Name binding of MAPK-PP on scaffold

Reaction equation

$$\text{K\_1\_2} + \text{S\_m1\_0\_m1} \longrightarrow \text{S\_2\_0\_m1} \tag{169}$$
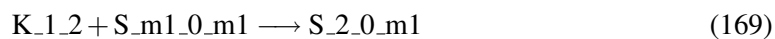
Reactants

Table 261: Properties of each reactant.

Id	Name	SBO
K_1_2	MAPK-PP	
S_m1_0_m1	Scaffold_MEK	

Product

Table 262: Properties of each product.

Id	Name	SBO
S_2_0_m1	Scaffold_MAPK-PP_MEK	

Kinetic Law

Derived unit contains undeclared units

$$v_{85} = \text{kpon} \cdot \text{K\_1\_2} \cdot \text{S\_m1\_0\_m1} \tag{170}$$

## Table 263: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpon			0.0		☑

5.86 Reaction `Reaction86`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of MAPK-PP from scaffold

Reaction equation

$$\text{S\_2\_0\_m1} \longrightarrow \text{K\_1\_2} + \text{S\_m1\_0\_m1} \tag{171}$$
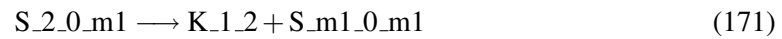
Reactant

Table 264: Properties of each reactant.

Id	Name	SBO
S_2_0_m1	Scaffold_MAPK-PP_MEK	

Products

Table 265: Properties of each product.

Id	Name	SBO
K_1_2	MAPK-PP	
S_m1_0_m1	Scaffold_MEK	

Kinetic Law

Derived unit contains undeclared units

$$v_{86} = \text{kpoff} \cdot \text{S\_2\_0\_m1} \tag{172}$$

Table 266: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpoff			0.05		☑

5.87 Reaction `Reaction87`

This is an irreversible reaction of two reactants forming one product.

Name binding of MAPK-PP on scaffold

Reaction equation

$$\text{K\_1\_2} + \text{S\_m1\_0\_0} \longrightarrow \text{S\_2\_0\_0} \tag{173}$$
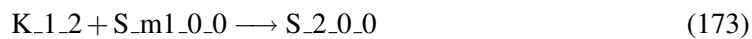
Reactants

Table 267: Properties of each reactant.

Id	Name	SBO
K_1_2	MAPK-PP	
S_m1_0_0	Scaffold_MEK_RAF	

Product

Table 268: Properties of each product.

Id	Name	SBO
S_2_0_0	Scaffold_MAPK-PP_MEK_RAF	

Kinetic Law

Derived unit contains undeclared units

$$v_{87} = \text{kpon} \cdot \text{K\_1\_2} \cdot \text{S\_m1\_0\_0} \tag{174}$$

Table 269: Properties of each parameter.

| Id	Name	SBO	Value	Unit	Constant
kpon			0.0		☑

5.88 Reaction `Reaction88`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of MAPK-PP from scaffold

Reaction equation

$$S\_2\_0\_0 \longrightarrow K\_1\_2 + S\_m1\_0\_0 \tag{175}$$
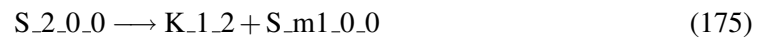
Reactant

Table 270: Properties of each reactant.

Id	Name	SBO
S_2_0_0	Scaffold_MAPK-PP_MEK_RAF	

Products

Table 271: Properties of each product.

Id	Name	SBO
K_1_2	MAPK-PP	
S_m1_0_0	Scaffold_MEK_RAF	

Kinetic Law

Derived unit contains undeclared units

$$v_{88} = \mathrm{kpoff} \cdot S\_2\_0\_0 \tag{176}$$

Table 272: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpoff			0.05		☑

5.89 Reaction `Reaction89`

This is an irreversible reaction of two reactants forming one product.

Name binding of MAPK-PP on scaffold

Reaction equation

$$K\_1\_2 + S\_m1\_0\_1 \longrightarrow S\_2\_0\_1 \tag{177}$$
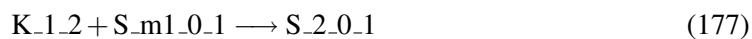
Reactants

Table 273: Properties of each reactant.

Id	Name	SBO
K_1_2	MAPK-PP	
S_m1_0_1	Scaffold_MEK_RAF-P	

Product

Table 274: Properties of each product.

Id	Name	SBO
S_2_0_1	Scaffold_MAPK-PP_MEK_RAF-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{89} = \mathrm{kpon} \cdot K\_1\_2 \cdot S\_m1\_0\_1 \tag{178}$$

Table 275: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpon			0.0		✓

5.90 Reaction `Reaction90`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of MAPK-PP from scaffold

Reaction equation

$$S\_2\_0\_1 \longrightarrow K\_1\_2 + S\_m1\_0\_1 \tag{179}$$
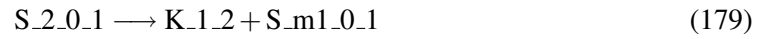
Reactant

Table 276: Properties of each reactant.

Id	Name	SBO
S_2_0_1	Scaffold_MAPK-PP_MEK_RAF-P	

Products

Table 277: Properties of each product.

Id	Name	SBO
K_1_2	MAPK-PP	
S_m1_0_1	Scaffold_MEK_RAF-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{90} = \text{kpoff} \cdot S\_2\_0\_1 \tag{180}$$

Table 278: Properties of each parameter.

| Id	Name	SBO	Value	Unit	Constant
kpoff			0.05		☑

5.91 Reaction `Reaction91`

This is an irreversible reaction of two reactants forming one product.

Name binding of MAPK-PP on scaffold

Reaction equation

$$K\_1\_2 + S\_m1\_1\_m1 \longrightarrow S\_2\_1\_m1 \tag{181}$$
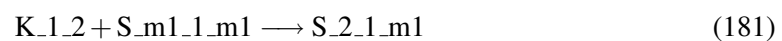
Reactants

Table 279: Properties of each reactant.

Id	Name	SBO
K_1_2	MAPK-PP	
S_m1_1_m1	Scaffold_MEK-P	

Product

Table 280: Properties of each product.

Id	Name	SBO
S_2_1_m1	Scaffold_MAPK-PP_MEK-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{91} = \text{kpon} \cdot \text{K\_1\_2} \cdot \text{S\_m1\_1\_m1} \tag{182}$$

Table 281: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpon			0.0		☑

5.92 Reaction `Reaction92`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of MAPK-PP from scaffold

Reaction equation

$$\text{S\_2\_1\_m1} \longrightarrow \text{K\_1\_2} + \text{S\_m1\_1\_m1} \tag{183}$$
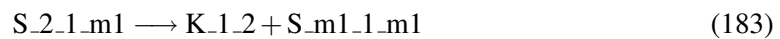
Reactant

Table 282: Properties of each reactant.

Id	Name	SBO
S_2_1_m1	Scaffold_MAPK-PP_MEK-P	

Products

Table 283: Properties of each product.

Id	Name	SBO
K_1_2	MAPK-PP	
S_m1_1_m1	Scaffold_MEK-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{92} = \text{kpoff} \cdot \text{S\_2\_1\_m1} \tag{184}$$

Table 284: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpoff			0.05		☑

5.93 Reaction `Reaction93`

This is an irreversible reaction of two reactants forming one product.

Name binding of MAPK-PP on scaffold

Reaction equation

$$\text{K\_1\_2} + \text{S\_m1\_1\_0} \longrightarrow \text{S\_2\_1\_0} \tag{185}$$
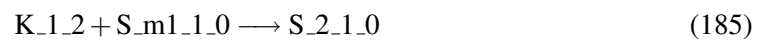
Reactants

Table 285: Properties of each reactant.

Id	Name	SBO
K_1_2	MAPK-PP	
S_m1_1_0	Scaffold_MEK-P_RAF	

Product

Table 286: Properties of each product.

Id	Name	SBO
S_2_1_0	Scaffold_MAPK-PP_MEK-P_RAF	

Kinetic Law

Derived unit contains undeclared units

$$v_{93} = \text{kpon} \cdot \text{K\_1\_2} \cdot \text{S\_m1\_1\_0} \tag{186}$$

Table 287: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpon			0.0		☑

5.94 Reaction `Reaction94`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of MAPK-PP from scaffold

Reaction equation

$$\text{S\_2\_1\_0} \longrightarrow \text{K\_1\_2} + \text{S\_m1\_1\_0} \tag{187}$$
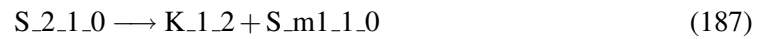
Reactant

Table 288: Properties of each reactant.

Id	Name	SBO
S_2_1_0	Scaffold_MAPK-PP_MEK-P_RAF	

Products

Table 289: Properties of each product.

Id	Name	SBO
K_1_2	MAPK-PP	
S_m1_1_0	Scaffold_MEK-P_RAF	

Kinetic Law

Derived unit contains undeclared units

$$v_{94} = \text{kpoff} \cdot \text{S\_2\_1\_0} \tag{188}$$

Table 290: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpoff			0.05		☑

5.95 Reaction `Reaction95`

This is an irreversible reaction of two reactants forming one product.

Name binding of MAPK-PP on scaffold

Reaction equation

$$\text{K\_1\_2} + \text{S\_m1\_1\_1} \longrightarrow \text{S\_2\_1\_1} \tag{189}$$
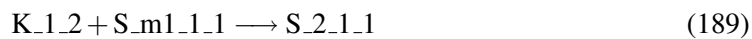
Reactants

Table 291: Properties of each reactant.

Id	Name	SBO
K_1_2	MAPK-PP	
S_m1_1_1	Scaffold_MEK-P_RAF-P	

Product

Table 292: Properties of each product.

Id	Name	SBO
S_2_1_1	Scaffold_MAPK-PP_MEK-P_RAF-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{95} = \text{kpon} \cdot \text{K\_1\_2} \cdot \text{S\_m1\_1\_1} \tag{190}$$

Table 293: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpon			0.0		☑

5.96 Reaction `Reaction96`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of MAPK-PP from scaffold

Reaction equation

$$S\_2\_1\_1 \longrightarrow K\_1\_2 + S\_m1\_1\_1 \tag{191}$$
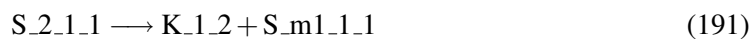
Reactant

Table 294: Properties of each reactant.

Id	Name	SBO
S_2_1_1	Scaffold_MAPK-PP_MEK-P_RAF-P	

Products

Table 295: Properties of each product.

Id	Name	SBO
K_1_2	MAPK-PP	
S_m1_1_1	Scaffold_MEK-P_RAF-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{96} = \text{kpoff} \cdot \text{S\_2\_1\_1} \tag{192}$$

Table 296: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpoff			0.05		☑

5.97 Reaction `Reaction97`

This is an irreversible reaction of two reactants forming one product.

Name binding of MAPK-PP on scaffold

Reaction equation

$$\text{K\_1\_2} + \text{S\_m1\_2\_m1} \longrightarrow \text{S\_2\_2\_m1} \tag{193}$$
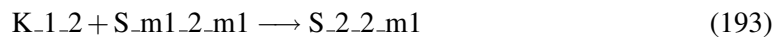
Reactants

Table 297: Properties of each reactant.

Id	Name	SBO
K_1_2	MAPK-PP	
S_m1_2_m1	Scaffold_MEK-PP	

Product

Table 298: Properties of each product.

Id	Name	SBO
S_2_2_m1	Scaffold_MAPK-PP_MEK-PP	

Kinetic Law

Derived unit contains undeclared units

$$v_{97} = \text{kpon} \cdot \text{K\_1\_2} \cdot \text{S\_m1\_2\_m1} \tag{194}$$

Table 299: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpon			0.0		☑

5.98 Reaction `Reaction98`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of MAPK-PP from scaffold

Reaction equation

$$S\_2\_2\_m1 \longrightarrow K\_1\_2 + S\_m1\_2\_m1 \tag{195}$$
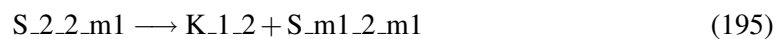
Reactant

Table 300: Properties of each reactant.

Id	Name	SBO
S_2_2_m1	Scaffold_MAPK-PP_MEK-PP	

Products

Table 301: Properties of each product.

Id	Name	SBO
K_1_2	MAPK-PP	
S_m1_2_m1	Scaffold_MEK-PP	

Kinetic Law

Derived unit contains undeclared units

$$v_{98} = \text{kpoff} \cdot S\_2\_2\_m1 \tag{196}$$

Table 302: Properties of each parameter.

| Id	Name	SBO	Value	Unit	Constant
kpoff			0.05		☑

5.99 Reaction `Reaction99`

This is an irreversible reaction of two reactants forming one product.

Name binding of MAPK-PP on scaffold

Reaction equation

$$K\_1\_2 + S\_m1\_2\_0 \longrightarrow S\_2\_2\_0 \tag{197}$$
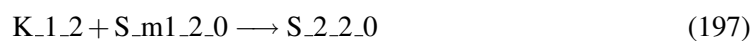
Reactants

Table 303: Properties of each reactant.

Id	Name	SBO
K_1_2	MAPK-PP	
S_m1_2_0	Scaffold_MEK-PP_RAF	

Product

Table 304: Properties of each product.

Id	Name	SBO
S_2_2_0	Scaffold_MAPK-PP_MEK-PP_RAF	

Kinetic Law

Derived unit contains undeclared units

$$v_{99} = \text{kpon} \cdot \text{K\_1\_2} \cdot \text{S\_m1\_2\_0} \tag{198}$$

Table 305: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpon			0.0		☑

5.100 Reaction `Reaction100`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of MAPK-PP from scaffold

Reaction equation

$$\text{S\_2\_2\_0} \longrightarrow \text{K\_1\_2} + \text{S\_m1\_2\_0} \tag{199}$$
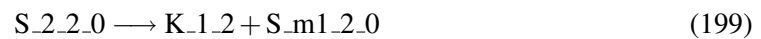
Reactant

Table 306: Properties of each reactant.

Id	Name	SBO
S_2_2_0	Scaffold_MAPK-PP_MEK-PP_RAF	

Products

<div align="center">

Table 307: Properties of each product.

Id	Name	SBO
K_1_2	MAPK-PP	
S_m1_2_0	Scaffold_MEK-PP_RAF	

</div>

Kinetic Law

Derived unit contains undeclared units

$$v_{100} = \text{kpoff} \cdot \text{S\_2\_2\_0} \tag{200}$$

<div align="center">

Table 308: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpoff			0.05		☑

</div>

5.101 Reaction Reaction101

This is an irreversible reaction of two reactants forming one product.

Name binding of MAPK-PP on scaffold

Reaction equation

$$\text{K\_1\_2} + \text{S\_m1\_2\_1} \longrightarrow \text{S\_2\_2\_1} \tag{201}$$
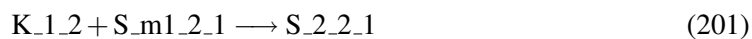
Reactants

<div align="center">

Table 309: Properties of each reactant.

Id	Name	SBO
K_1_2	MAPK-PP	
S_m1_2_1	Scaffold_MEK-PP_RAF-P	

</div>

Product

Table 310: Properties of each product.

Id	Name	SBO
S_2_2_1	Scaffold_MAPK-PP_MEK-PP_RAF-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{101} = \text{kpon} \cdot \text{K\_1\_2} \cdot \text{S\_m1\_2\_1} \tag{202}$$

Table 311: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpon			0.0		☑

5.102 Reaction `Reaction102`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of MAPK-PP from scaffold

Reaction equation

$$\text{S\_2\_2\_1} \longrightarrow \text{K\_1\_2} + \text{S\_m1\_2\_1} \tag{203}$$
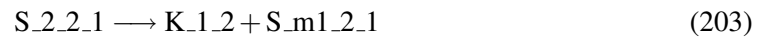
Reactant

Table 312: Properties of each reactant.

Id	Name	SBO
S_2_2_1	Scaffold_MAPK-PP_MEK-PP_RAF-P	

Products

Table 313: Properties of each product.

Id	Name	SBO
K_1_2	MAPK-PP	
S_m1_2_1	Scaffold_MEK-PP_RAF-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{102} = \text{kpoff} \cdot \text{S\_2\_2\_1} \tag{204}$$

Table 314: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpoff			0.05		☑

5.103 Reaction `Reaction103`

This is an irreversible reaction of two reactants forming one product.

Name binding of MEK on scaffold

Reaction equation

$$\text{K\_2\_0} + \text{S\_m1\_m1\_m1} \longrightarrow \text{S\_m1\_0\_m1} \tag{205}$$
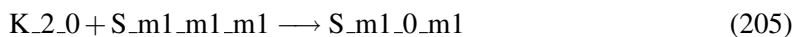
Reactants

Table 315: Properties of each reactant.

Id	Name	SBO
K_2_0	MEK	
S_m1_m1_m1	Scaffold	

Product

Table 316: Properties of each product.

Id	Name	SBO
S_m1_0_m1	Scaffold_MEK	

Kinetic Law

Derived unit contains undeclared units

$$v_{103} = \text{kon} \cdot \text{K\_2\_0} \cdot \text{S\_m1\_m1\_m1} \tag{206}$$

Table 317: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kon			10.0		☑

5.104 Reaction `Reaction104`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of MEK from scaffold

Reaction equation

$$S\_m1\_0\_m1 \longrightarrow K\_2\_0 + S\_m1\_m1\_m1 \tag{207}$$
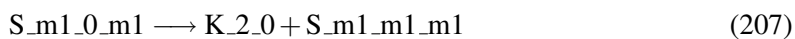
Reactant

Table 318: Properties of each reactant.

Id	Name	SBO
S_m1_0_m1	Scaffold_MEK	

Products

Table 319: Properties of each product.

Id	Name	SBO
K_2_0	MEK	
S_m1_m1_m1	Scaffold	

Kinetic Law

Derived unit contains undeclared units

$$v_{104} = \text{koff} \cdot S\_m1\_0\_m1 \tag{208}$$

Table 320: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
koff			0.5		☑

5.105 Reaction `Reaction105`

This is an irreversible reaction of two reactants forming one product.

Name binding of MEK on scaffold

Reaction equation

$$K\_2\_0 + S\_m1\_m1\_0 \longrightarrow S\_m1\_0\_0 \tag{209}$$
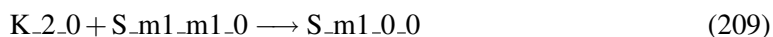
Reactants

Table 321: Properties of each reactant.

Id	Name	SBO
K_2_0	MEK	
S_m1_m1_0	Scaffold_RAF	

Product

Table 322: Properties of each product.

Id	Name	SBO
S_m1_0_0	Scaffold_MEK_RAF	

Kinetic Law

Derived unit contains undeclared units

$$v_{105} = \mathrm{kon} \cdot K\_2\_0 \cdot S\_m1\_m1\_0 \tag{210}$$

Table 323: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kon			10.0		✓

5.106 Reaction `Reaction106`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of MEK from scaffold

Reaction equation

$$S\_m1\_0\_0 \longrightarrow K\_2\_0 + S\_m1\_m1\_0 \tag{211}$$
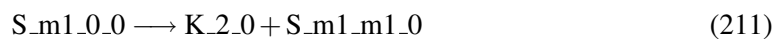
Reactant

Table 324: Properties of each reactant.

Id	Name	SBO
S_m1_0_0	Scaffold_MEK_RAF	

Products

Table 325: Properties of each product.

Id	Name	SBO
K_2_0	MEK	
S_m1_m1_0	Scaffold_RAF	

Kinetic Law

Derived unit contains undeclared units

$$v_{106} = \text{koff} \cdot S\_m1\_0\_0 \tag{212}$$

Table 326: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
koff			0.5		☑

5.107 Reaction `Reaction107`

This is an irreversible reaction of two reactants forming one product.

Name binding of MEK on scaffold

Reaction equation

$$K\_2\_0 + S\_m1\_m1\_1 \longrightarrow S\_m1\_0\_1 \tag{213}$$
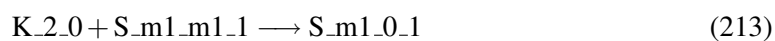
Reactants

Table 327: Properties of each reactant.

Id	Name	SBO
K_2_0	MEK	
S_m1_m1_1	Scaffold_RAF-P	

Product

Table 328: Properties of each product.

Id	Name	SBO
S_m1_0_1	Scaffold_MEK_RAF-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{107} = \text{kon} \cdot \text{K\_2\_0} \cdot \text{S\_m1\_m1\_1} \tag{214}$$

Table 329: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kon			10.0		☑

5.108 Reaction `Reaction108`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of MEK from scaffold

Reaction equation

$$\text{S\_m1\_0\_1} \longrightarrow \text{K\_2\_0} + \text{S\_m1\_m1\_1} \tag{215}$$
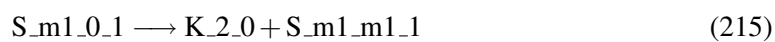
Reactant

Table 330: Properties of each reactant.

Id	Name	SBO
S_m1_0_1	Scaffold_MEK_RAF-P	

Products

Table 331: Properties of each product.

Id	Name	SBO
K_2_0	MEK	
S_m1_m1_1	Scaffold_RAF-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{108} = \text{koff} \cdot \text{S\_m1\_0\_1} \tag{216}$$

Table 332: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
koff			0.5		☑

5.109 Reaction Reaction109

This is an irreversible reaction of two reactants forming one product.

Name binding of MEK-P on scaffold

Reaction equation

$$\text{K\_2\_1} + \text{S\_m1\_m1\_m1} \longrightarrow \text{S\_m1\_1\_m1} \tag{217}$$
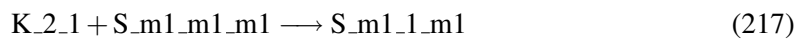
Reactants

Table 333: Properties of each reactant.

Id	Name	SBO
K_2_1	MEK-P	
S_m1_m1_m1	Scaffold	

Product

Table 334: Properties of each product.

Id	Name	SBO
S_m1_1_m1	Scaffold_MEK-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{109} = \text{kpon} \cdot \text{K\_2\_1} \cdot \text{S\_m1\_m1\_m1} \tag{218}$$

Table 335: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpon			0.0		☑

5.110 Reaction `Reaction110`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of MEK-P from scaffold

Reaction equation

$$\text{S\_m1\_1\_m1} \longrightarrow \text{K\_2\_1} + \text{S\_m1\_m1\_m1} \tag{219}$$
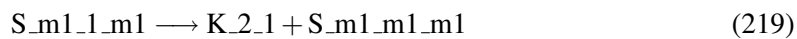
Reactant

Table 336: Properties of each reactant.

Id	Name	SBO
S_m1_1_m1	Scaffold_MEK-P	

Products

Table 337: Properties of each product.

Id	Name	SBO
K_2_1	MEK-P	
S_m1_m1_m1	Scaffold	

Kinetic Law

Derived unit contains undeclared units

$$v_{110} = \text{kpoff} \cdot \text{S\_m1\_1\_m1} \tag{220}$$

Table 338: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpoff			0.05		☑

5.111 Reaction `Reaction111`

This is an irreversible reaction of two reactants forming one product.

Name binding of MEK-P on scaffold

Reaction equation

$$\text{K\_2\_1} + \text{S\_m1\_m1\_0} \longrightarrow \text{S\_m1\_1\_0} \tag{221}$$
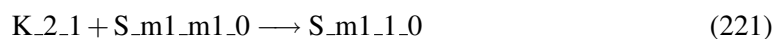
Reactants

Table 339: Properties of each reactant.

Id	Name	SBO
K_2_1	MEK-P	
S_m1_m1_0	Scaffold_RAF	

Product

Table 340: Properties of each product.

Id	Name	SBO
S_m1_1_0	Scaffold_MEK-P_RAF	

Kinetic Law

Derived unit contains undeclared units

$$v_{111} = \text{kpon} \cdot \text{K\_2\_1} \cdot \text{S\_m1\_m1\_0} \tag{222}$$

Table 341: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpon			0.0		☑

5.112 Reaction `Reaction112`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of MEK-P from scaffold

Reaction equation

$$S\_m1\_1\_0 \longrightarrow K\_2\_1 + S\_m1\_m1\_0 \tag{223}$$
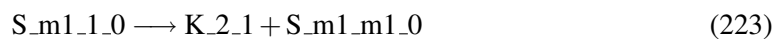
Reactant

Table 342: Properties of each reactant.

Id	Name	SBO
S_m1_1_0	Scaffold_MEK-P_RAF	

Products

Table 343: Properties of each product.

Id	Name	SBO
K_2_1	MEK-P	
S_m1_m1_0	Scaffold_RAF	

Kinetic Law

Derived unit contains undeclared units

$$v_{112} = \text{kpoff} \cdot S\_m1\_1\_0 \tag{224}$$

Table 344: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpoff			0.05		☑

5.113 Reaction `Reaction113`

This is an irreversible reaction of two reactants forming one product.

Name binding of MEK-P on scaffold

Reaction equation

$$K\_2\_1 + S\_m1\_m1\_1 \longrightarrow S\_m1\_1\_1 \tag{225}$$
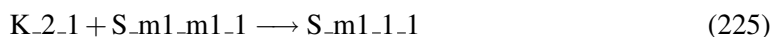
Reactants

Table 345: Properties of each reactant.

Id	Name	SBO
K_2_1	MEK-P	
S_m1_m1_1	Scaffold_RAF-P	

Product

Table 346: Properties of each product.

Id	Name	SBO
S_m1_1_1	Scaffold_MEK-P_RAF-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{113} = \text{kpon} \cdot K\_2\_1 \cdot S\_m1\_m1\_1 \tag{226}$$

Table 347: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpon			0.0		☑

5.114 Reaction `Reaction114`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of MEK-P from scaffold

Produced by SBML2LATEX

Reaction equation

$$S\_m1\_1\_1 \longrightarrow K\_2\_1 + S\_m1\_m1\_1 \tag{227}$$
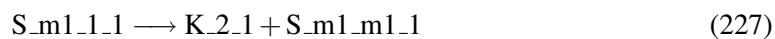
Reactant

Table 348: Properties of each reactant.

Id	Name	SBO
S_m1_1_1	Scaffold_MEK-P_RAF-P	

Products

Table 349: Properties of each product.

Id	Name	SBO
K_2_1	MEK-P	
S_m1_m1_1	Scaffold_RAF-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{114} = \text{kpoff} \cdot S\_m1\_1\_1 \tag{228}$$

Table 350: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpoff			0.05		☑

5.115 Reaction `Reaction115`

This is an irreversible reaction of two reactants forming one product.

Name binding of MEK-PP on scaffold

Reaction equation

$$K\_2\_2 + S\_m1\_m1\_m1 \longrightarrow S\_m1\_2\_m1 \tag{229}$$
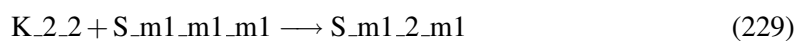
Reactants

Table 351: Properties of each reactant.

Id	Name	SBO
K_2_2	MEK-PP	
S_m1_m1_m1	Scaffold	

Product

Table 352: Properties of each product.

Id	Name	SBO
S_m1_2_m1	Scaffold_MEK-PP	

Kinetic Law

Derived unit contains undeclared units

$$v_{115} = \text{kpon} \cdot \text{K\_2\_2} \cdot \text{S\_m1\_m1\_m1} \tag{230}$$

Table 353: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpon			0.0		☑

5.116 Reaction Reaction116

This is an irreversible reaction of one reactant forming two products.

Name dissociation of MEK-PP from scaffold

Reaction equation

$$\text{S\_m1\_2\_m1} \longrightarrow \text{K\_2\_2} + \text{S\_m1\_m1\_m1} \tag{231}$$
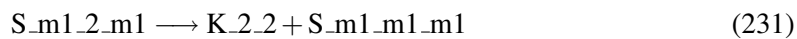
Reactant

Table 354: Properties of each reactant.

Id	Name	SBO
S_m1_2_m1	Scaffold_MEK-PP	

Products

Table 355: Properties of each product.

Id	Name	SBO
K_2_2	MEK-PP	
S_m1_m1_m1	Scaffold	

Kinetic Law

Derived unit contains undeclared units

$$v_{116} = \text{kpoff} \cdot \text{S\_m1\_2\_m1} \tag{232}$$

Table 356: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpoff			0.05		☑

5.117 Reaction `Reaction117`

This is an irreversible reaction of two reactants forming one product.

Name binding of MEK-PP on scaffold

Reaction equation

$$\text{K\_2\_2} + \text{S\_m1\_m1\_0} \longrightarrow \text{S\_m1\_2\_0} \tag{233}$$
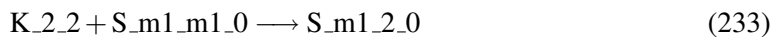
Reactants

Table 357: Properties of each reactant.

Id	Name	SBO
K_2_2	MEK-PP	
S_m1_m1_0	Scaffold_RAF	

Product

Table 358: Properties of each product.

Id	Name	SBO
S_m1_2_0	Scaffold_MEK-PP_RAF	

Kinetic Law

Derived unit contains undeclared units

$$v_{117} = \text{kpon} \cdot \text{K\_2\_2} \cdot \text{S\_m1\_m1\_0} \qquad (234)$$

Table 359: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpon			0.0		☑

5.118 Reaction Reaction118

This is an irreversible reaction of one reactant forming two products.

Name dissociation of MEK-PP from scaffold

Reaction equation

$$\text{S\_m1\_2\_0} \longrightarrow \text{K\_2\_2} + \text{S\_m1\_m1\_0} \qquad (235)$$
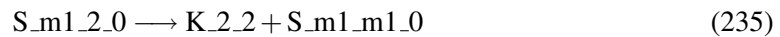
Reactant

Table 360: Properties of each reactant.

Id	Name	SBO
S_m1_2_0	Scaffold_MEK-PP_RAF	

Products

Table 361: Properties of each product.

Id	Name	SBO
K_2_2	MEK-PP	
S_m1_m1_0	Scaffold_RAF	

Kinetic Law

Derived unit contains undeclared units

$$v_{118} = \text{kpoff} \cdot \text{S\_m1\_2\_0} \tag{236}$$

Table 362: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpoff			0.05		☑

5.119 Reaction `Reaction119`

This is an irreversible reaction of two reactants forming one product.

Name binding of MEK-PP on scaffold

Reaction equation

$$\text{K\_2\_2} + \text{S\_m1\_m1\_1} \longrightarrow \text{S\_m1\_2\_1} \tag{237}$$
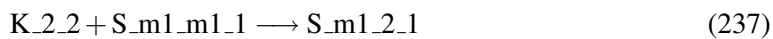
Reactants

Table 363: Properties of each reactant.

Id	Name	SBO
K_2_2	MEK-PP	
S_m1_m1_1	Scaffold_RAF-P	

Product

Table 364: Properties of each product.

Id	Name	SBO
S_m1_2_1	Scaffold_MEK-PP_RAF-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{119} = \text{kpon} \cdot \text{K\_2\_2} \cdot \text{S\_m1\_m1\_1} \tag{238}$$

Table 365: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpon			0.0		☑

5.120 Reaction `Reaction120`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of MEK-PP from scaffold

Reaction equation

$$\text{S\_m1\_2\_1} \longrightarrow \text{K\_2\_2} + \text{S\_m1\_m1\_1} \tag{239}$$
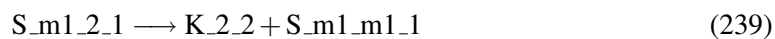
Reactant

Table 366: Properties of each reactant.

Id	Name	SBO
S_m1_2_1	Scaffold_MEK-PP_RAF-P	

Products

Table 367: Properties of each product.

Id	Name	SBO
K_2_2	MEK-PP	
S_m1_m1_1	Scaffold_RAF-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{120} = \text{kpoff} \cdot \text{S\_m1\_2\_1} \tag{240}$$

Table 368: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpoff			0.05		☑

5.121 Reaction `Reaction121`

This is an irreversible reaction of two reactants forming one product.

Name binding of MEK on scaffold

Reaction equation

$$K\_2\_0 + S\_0\_m1\_m1 \longrightarrow S\_0\_0\_m1 \tag{241}$$
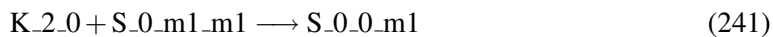
Reactants

Table 369: Properties of each reactant.

Id	Name	SBO
K_2_0	MEK	
S_0_m1_m1	Scaffold_MAPK	

Product

Table 370: Properties of each product.

Id	Name	SBO
S_0_0_m1	Scaffold_MAPK_MEK	

Kinetic Law

Derived unit contains undeclared units

$$v_{121} = \text{kon} \cdot K\_2\_0 \cdot S\_0\_m1\_m1 \tag{242}$$

Table 371: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kon			10.0		☑

5.122 Reaction `Reaction122`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of MEK from scaffold

Reaction equation

$$S\_0\_0\_m1 \longrightarrow K\_2\_0 + S\_0\_m1\_m1 \tag{243}$$
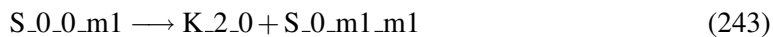
Reactant

Table 372: Properties of each reactant.

Id	Name	SBO
S_0_0_m1	Scaffold_MAPK_MEK	

Products

Table 373: Properties of each product.

Id	Name	SBO
K_2_0	MEK	
S_0_m1_m1	Scaffold_MAPK	

Kinetic Law

Derived unit contains undeclared units

$$v_{122} = \text{koff} \cdot S\_0\_0\_m1 \tag{244}$$

Table 374: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
koff			0.5		☑

5.123 Reaction `Reaction123`

This is an irreversible reaction of two reactants forming one product.

Name binding of MEK on scaffold

Reaction equation

$$K\_2\_0 + S\_0\_m1\_0 \longrightarrow S\_0\_0\_0 \tag{245}$$

Reactants

Produced by SBML2LATEX
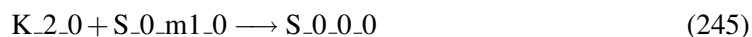
Table 375: Properties of each reactant.

Id	Name	SBO
K_2_0	MEK	
S_0_m1_0	Scaffold_MAPK_RAF	

Product

Table 376: Properties of each product.

Id	Name	SBO
S_0_0_0	Scaffold_MAPK_MEK_RAF	

Kinetic Law

Derived unit contains undeclared units

$$v_{123} = \text{kon} \cdot \text{K\_2\_0} \cdot \text{S\_0\_m1\_0} \tag{246}$$

Table 377: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kon			10.0		☑

5.124 Reaction `Reaction124`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of MEK from scaffold

Reaction equation

$$\text{S\_0\_0\_0} \longrightarrow \text{K\_2\_0} + \text{S\_0\_m1\_0} \tag{247}$$
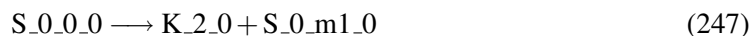
Reactant

Table 378: Properties of each reactant.

Id	Name	SBO
S_0_0_0	Scaffold_MAPK_MEK_RAF	

Products

Table 379: Properties of each product.

Id	Name	SBO
K_2_0	MEK	
S_0_m1_0	Scaffold_MAPK_RAF	

Kinetic Law

Derived unit contains undeclared units

$$v_{124} = \text{koff} \cdot \text{S\_0\_0\_0} \tag{248}$$

Table 380: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
koff			0.5		☑

5.125 Reaction `Reaction125`

This is an irreversible reaction of two reactants forming one product.

Name binding of MEK on scaffold

Reaction equation

$$\text{K\_2\_0} + \text{S\_0\_m1\_1} \longrightarrow \text{S\_0\_0\_1} \tag{249}$$
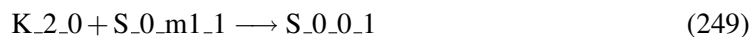
Reactants

Table 381: Properties of each reactant.

Id	Name	SBO
K_2_0	MEK	
S_0_m1_1	Scaffold_MAPK_RAF-P	

Product

Table 382: Properties of each product.

Id	Name	SBO
S_0_0_1	Scaffold_MAPK_MEK_RAF-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{125} = \text{kon} \cdot \text{K\_2\_0} \cdot \text{S\_0\_m1\_1} \tag{250}$$

Table 383: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kon			10.0		☑

5.126 Reaction `Reaction126`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of MEK from scaffold

Reaction equation

$$\text{S\_0\_0\_1} \longrightarrow \text{K\_2\_0} + \text{S\_0\_m1\_1} \tag{251}$$
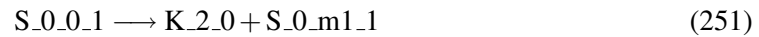
Reactant

Table 384: Properties of each reactant.

Id	Name	SBO
S_0_0_1	Scaffold_MAPK_MEK_RAF-P	

Products

Table 385: Properties of each product.

Id	Name	SBO
K_2_0	MEK	
S_0_m1_1	Scaffold_MAPK_RAF-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{126} = \text{koff} \cdot \text{S\_0\_0\_1} \tag{252}$$

Table 386: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
koff			0.5		☑

5.127 Reaction `Reaction127`

This is an irreversible reaction of two reactants forming one product.

Name binding of MEK-P on scaffold

Reaction equation

$$\text{K\_2\_1} + \text{S\_0\_m1\_m1} \longrightarrow \text{S\_0\_1\_m1} \tag{253}$$
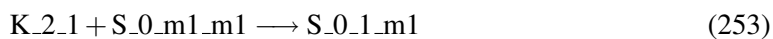
Reactants

Table 387: Properties of each reactant.

Id	Name	SBO
K_2_1	MEK-P	
S_0_m1_m1	Scaffold_MAPK	

Product

Table 388: Properties of each product.

Id	Name	SBO
S_0_1_m1	Scaffold_MAPK_MEK-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{127} = \text{kpon} \cdot \text{K\_2\_1} \cdot \text{S\_0\_m1\_m1} \tag{254}$$

Table 389: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpon			0.0		☑

5.128 Reaction `Reaction128`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of MEK-P from scaffold

Reaction equation

$$S\_0\_1\_m1 \longrightarrow K\_2\_1 + S\_0\_m1\_m1 \tag{255}$$
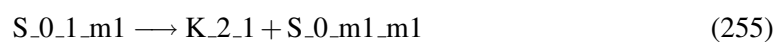
Reactant

Table 390: Properties of each reactant.

Id	Name	SBO
S_0_1_m1	Scaffold_MAPK_MEK-P	

Products

Table 391: Properties of each product.

Id	Name	SBO
K_2_1	MEK-P	
S_0_m1_m1	Scaffold_MAPK	

Kinetic Law

Derived unit contains undeclared units

$$v_{128} = \text{kpoff} \cdot S\_0\_1\_m1 \tag{256}$$

Table 392: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpoff			0.05		☑

5.129 Reaction `Reaction129`

This is an irreversible reaction of two reactants forming one product.

Name binding of MEK-P on scaffold

Reaction equation

$$\text{K\_2\_1} + \text{S\_0\_m1\_0} \longrightarrow \text{S\_0\_1\_0} \tag{257}$$
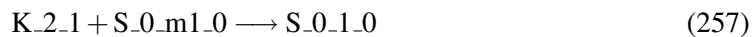
Reactants

Table 393: Properties of each reactant.

Id	Name	SBO
K_2_1	MEK-P	
S_0_m1_0	Scaffold_MAPK_RAF	

Product

Table 394: Properties of each product.

Id	Name	SBO
S_0_1_0	Scaffold_MAPK_MEK-P_RAF	

Kinetic Law

Derived unit contains undeclared units

$$v_{129} = \text{kpon} \cdot \text{K\_2\_1} \cdot \text{S\_0\_m1\_0} \tag{258}$$

Table 395: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpon			0.0		✓

5.130 Reaction `Reaction130`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of MEK-P from scaffold

Reaction equation

$$S\_0\_1\_0 \longrightarrow K\_2\_1 + S\_0\_m1\_0 \tag{259}$$
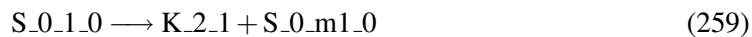
Reactant

Table 396: Properties of each reactant.

Id	Name	SBO
S_0_1_0	Scaffold_MAPK_MEK-P_RAF	

Products

Table 397: Properties of each product.

Id	Name	SBO
K_2_1	MEK-P	
S_0_m1_0	Scaffold_MAPK_RAF	

Kinetic Law

Derived unit contains undeclared units

$$v_{130} = \text{kpoff} \cdot S\_0\_1\_0 \tag{260}$$

Table 398: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpoff			0.05		☑

5.131 Reaction `Reaction131`

This is an irreversible reaction of two reactants forming one product.

Name binding of MEK-P on scaffold

Reaction equation

$$K\_2\_1 + S\_0\_m1\_1 \longrightarrow S\_0\_1\_1 \tag{261}$$
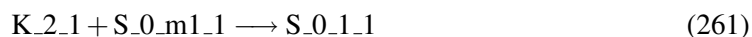
Reactants

Table 399: Properties of each reactant.

Id	Name	SBO
K_2_1	MEK-P	
S_0_m1_1	Scaffold_MAPK_RAF-P	

Product

Table 400: Properties of each product.

Id	Name	SBO
S_0_1_1	Scaffold_MAPK_MEK-P_RAF-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{131} = \text{kpon} \cdot \text{K\_2\_1} \cdot \text{S\_0\_m1\_1} \qquad (262)$$

Table 401: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpon			0.0		☑

5.132 Reaction Reaction132

This is an irreversible reaction of one reactant forming two products.

Name dissociation of MEK-P from scaffold

Reaction equation

$$\text{S\_0\_1\_1} \longrightarrow \text{K\_2\_1} + \text{S\_0\_m1\_1} \qquad (263)$$
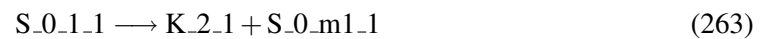
Reactant

Table 402: Properties of each reactant.

Id	Name	SBO
S_0_1_1	Scaffold_MAPK_MEK-P_RAF-P	

Products

Table 403: Properties of each product.

Id	Name	SBO
K_2_1	MEK-P	
S_0_m1_1	Scaffold_MAPK_RAF-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{132} = \text{kpoff} \cdot \text{S\_0\_1\_1} \tag{264}$$

Table 404: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpoff			0.05		☑

5.133 Reaction `Reaction133`

This is an irreversible reaction of two reactants forming one product.

Name binding of MEK-PP on scaffold

Reaction equation

$$\text{K\_2\_2} + \text{S\_0\_m1\_m1} \longrightarrow \text{S\_0\_2\_m1} \tag{265}$$
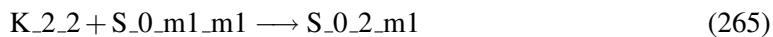
Reactants

Table 405: Properties of each reactant.

Id	Name	SBO
K_2_2	MEK-PP	
S_0_m1_m1	Scaffold_MAPK	

Product

Table 406: Properties of each product.

Id	Name	SBO
S_0_2_m1	Scaffold_MAPK_MEK-PP	

Kinetic Law

Derived unit contains undeclared units

$$v_{133} = \text{kpon} \cdot \text{K\_2\_2} \cdot \text{S\_0\_m1\_m1} \tag{266}$$

Table 407: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpon			0.0		☑

5.134 Reaction `Reaction134`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of MEK-PP from scaffold

Reaction equation

$$\text{S\_0\_2\_m1} \longrightarrow \text{K\_2\_2} + \text{S\_0\_m1\_m1} \tag{267}$$
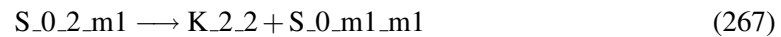
Reactant

Table 408: Properties of each reactant.

Id	Name	SBO
S_0_2_m1	Scaffold_MAPK_MEK-PP	

Products

Table 409: Properties of each product.

Id	Name	SBO
K_2_2	MEK-PP	
S_0_m1_m1	Scaffold_MAPK	

Kinetic Law

Derived unit contains undeclared units

$$v_{134} = \text{kpoff} \cdot \text{S\_0\_2\_m1} \tag{268}$$

Table 410: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpoff			0.05		☑

5.135 Reaction `Reaction135`

This is an irreversible reaction of two reactants forming one product.

Name binding of MEK-PP on scaffold

Reaction equation

$$\text{K\_2\_2} + \text{S\_0\_m1\_0} \longrightarrow \text{S\_0\_2\_0} \tag{269}$$
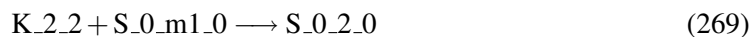
Reactants

Table 411: Properties of each reactant.

Id	Name	SBO
K_2_2	MEK-PP	
S_0_m1_0	Scaffold_MAPK_RAF	

Product

Table 412: Properties of each product.

Id	Name	SBO
S_0_2_0	Scaffold_MAPK_MEK-PP_RAF	

Kinetic Law

Derived unit contains undeclared units

$$v_{135} = \text{kpon} \cdot \text{K\_2\_2} \cdot \text{S\_0\_m1\_0} \tag{270}$$

Table 413: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpon			0.0		☑

5.136 Reaction Reaction136

This is an irreversible reaction of one reactant forming two products.

Name dissociation of MEK-PP from scaffold

Reaction equation

$$S\_0\_2\_0 \longrightarrow K\_2\_2 + S\_0\_m1\_0 \tag{271}$$
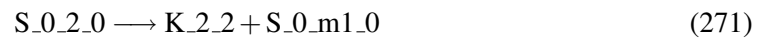
Reactant

Table 414: Properties of each reactant.

Id	Name	SBO
S_0_2_0	Scaffold_MAPK_MEK-PP_RAF	

Products

Table 415: Properties of each product.

Id	Name	SBO
K_2_2	MEK-PP	
S_0_m1_0	Scaffold_MAPK_RAF	

Kinetic Law

Derived unit contains undeclared units

$$v_{136} = \text{kpoff} \cdot S\_0\_2\_0 \tag{272}$$

Table 416: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpoff			0.05		☑

5.137 Reaction `Reaction137`

This is an irreversible reaction of two reactants forming one product.

Name binding of MEK-PP on scaffold

Reaction equation

$$K\_2\_2 + S\_0\_m1\_1 \longrightarrow S\_0\_2\_1 \tag{273}$$
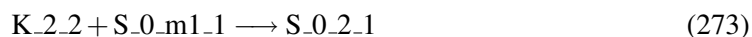
Reactants

Table 417: Properties of each reactant.

Id	Name	SBO
K_2_2	MEK-PP	
S_0_m1_1	Scaffold_MAPK_RAF-P	

Product

Table 418: Properties of each product.

Id	Name	SBO
S_0_2_1	Scaffold_MAPK_MEK-PP_RAF-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{137} = \mathrm{kpon} \cdot \mathrm{K\_2\_2} \cdot \mathrm{S\_0\_m1\_1} \tag{274}$$

Table 419: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpon			0.0		☑

5.138 Reaction `Reaction138`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of MEK-PP from scaffold

Reaction equation

$$S\_0\_2\_1 \longrightarrow K\_2\_2 + S\_0\_m1\_1 \tag{275}$$
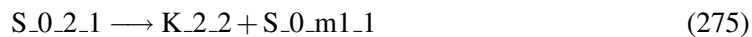
Reactant

Table 420: Properties of each reactant.

Id	Name	SBO
S_0_2_1	Scaffold_MAPK_MEK-PP_RAF-P	

Products

Table 421: Properties of each product.

Id	Name	SBO
K_2_2	MEK-PP	
S_0_m1_1	Scaffold_MAPK_RAF-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{138} = \text{kpoff} \cdot S\_0\_2\_1 \tag{276}$$

Table 422: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpoff			0.05		☑

5.139 Reaction `Reaction139`

This is an irreversible reaction of two reactants forming one product.

Name binding of MEK on scaffold

Reaction equation

$$K\_2\_0 + S\_1\_m1\_m1 \longrightarrow S\_1\_0\_m1 \tag{277}$$
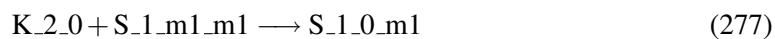
Reactants

Table 423: Properties of each reactant.

Id	Name	SBO
K_2_0	MEK	
S_1_m1_m1	Scaffold_MAPK-P	

Product

Table 424: Properties of each product.

Id	Name	SBO
S_1_0_m1	Scaffold_MAPK-P_MEK	

Kinetic Law

Derived unit contains undeclared units

$$v_{139} = \text{kon} \cdot \text{K\_2\_0} \cdot \text{S\_1\_m1\_m1} \tag{278}$$

Table 425: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kon			10.0		☑

5.140 Reaction `Reaction140`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of MEK from scaffold

Reaction equation

$$\text{S\_1\_0\_m1} \longrightarrow \text{K\_2\_0} + \text{S\_1\_m1\_m1} \tag{279}$$
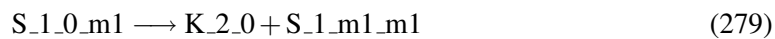
Reactant

Table 426: Properties of each reactant.

Id	Name	SBO
S_1_0_m1	Scaffold_MAPK-P_MEK	

Products

Table 427: Properties of each product.

Id	Name	SBO
K_2_0	MEK	
S_1_m1_m1	Scaffold_MAPK-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{140} = \text{koff} \cdot \text{S\_1\_0\_m1} \tag{280}$$

Table 428: Properties of each parameter.

| Id	Name	SBO	Value	Unit	Constant
koff			0.5		☑

5.141 Reaction `Reaction141`

This is an irreversible reaction of two reactants forming one product.

Name binding of MEK on scaffold

Reaction equation

$$\text{K\_2\_0} + \text{S\_1\_m1\_0} \longrightarrow \text{S\_1\_0\_0} \tag{281}$$
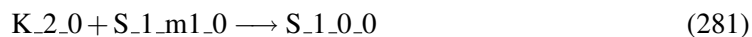
Reactants

Table 429: Properties of each reactant.

Id	Name	SBO
K_2_0	MEK	
S_1_m1_0	Scaffold_MAPK-P_RAF	

Product

Table 430: Properties of each product.

Id	Name	SBO
S_1_0_0	Scaffold_MAPK-P_MEK_RAF	

Kinetic Law

Derived unit contains undeclared units

$$v_{141} = \text{kon} \cdot \text{K\_2\_0} \cdot \text{S\_1\_m1\_0} \tag{282}$$

Table 431: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kon			10.0		✓

5.142 Reaction `Reaction142`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of MEK from scaffold

Reaction equation

$$\text{S\_1\_0\_0} \longrightarrow \text{K\_2\_0} + \text{S\_1\_m1\_0} \tag{283}$$
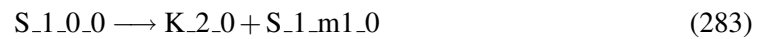
Reactant

Table 432: Properties of each reactant.

Id	Name	SBO
S_1_0_0	Scaffold_MAPK-P_MEK_RAF	

Products

Table 433: Properties of each product.

Id	Name	SBO
K_2_0	MEK	
S_1_m1_0	Scaffold_MAPK-P_RAF	

Kinetic Law

Derived unit contains undeclared units

$$v_{142} = \mathrm{koff} \cdot \mathrm{S\_1\_0\_0} \tag{284}$$

Table 434: Properties of each parameter.

| Id	Name	SBO	Value	Unit	Constant
koff			0.5		☑

5.143 Reaction `Reaction143`

This is an irreversible reaction of two reactants forming one product.

Name binding of MEK on scaffold

Reaction equation

$$\mathrm{K\_2\_0} + \mathrm{S\_1\_m1\_1} \longrightarrow \mathrm{S\_1\_0\_1} \tag{285}$$
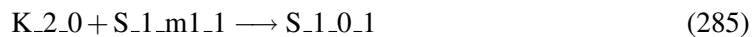
Reactants

Table 435: Properties of each reactant.

Id	Name	SBO
K_2_0	MEK	
S_1_m1_1	Scaffold_MAPK-P_RAF-P	

Product

Table 436: Properties of each product.

Id	Name	SBO
S_1_0_1	Scaffold_MAPK-P_MEK_RAF-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{143} = \mathrm{kon} \cdot \mathrm{K\_2\_0} \cdot \mathrm{S\_1\_m1\_1} \tag{286}$$

Table 437: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kon			10.0		☑

5.144 Reaction `Reaction144`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of MEK from scaffold

Reaction equation

$$S\_1\_0\_1 \longrightarrow K\_2\_0 + S\_1\_m1\_1 \qquad (287)$$
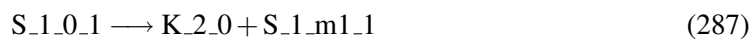
Reactant

Table 438: Properties of each reactant.

Id	Name	SBO
S_1_0_1	Scaffold_MAPK-P_MEK_RAF-P	

Products

Table 439: Properties of each product.

Id	Name	SBO
K_2_0	MEK	
S_1_m1_1	Scaffold_MAPK-P_RAF-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{144} = \text{koff} \cdot S\_1\_0\_1 \qquad (288)$$

Table 440: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
koff			0.5		☑

5.145 Reaction `Reaction145`

This is an irreversible reaction of two reactants forming one product.

Name binding of MEK-P on scaffold

Reaction equation

$$K\_2\_1 + S\_1\_m1\_m1 \longrightarrow S\_1\_1\_m1 \tag{289}$$
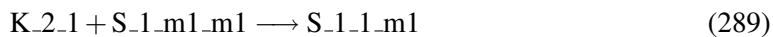
Reactants

Table 441: Properties of each reactant.

Id	Name	SBO
K_2_1	MEK-P	
S_1_m1_m1	Scaffold_MAPK-P	

Product

Table 442: Properties of each product.

Id	Name	SBO
S_1_1_m1	Scaffold_MAPK-P_MEK-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{145} = \text{kpon} \cdot K\_2\_1 \cdot S\_1\_m1\_m1 \tag{290}$$

Table 443: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpon			0.0		✓

5.146 Reaction `Reaction146`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of MEK-P from scaffold

Reaction equation

$$\text{S\_1\_1\_m1} \longrightarrow \text{K\_2\_1} + \text{S\_1\_m1\_m1} \tag{291}$$
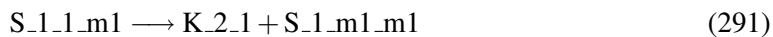
Reactant

Table 444: Properties of each reactant.

Id	Name	SBO
S_1_1_m1	Scaffold_MAPK-P_MEK-P	

Products

Table 445: Properties of each product.

Id	Name	SBO
K_2_1	MEK-P	
S_1_m1_m1	Scaffold_MAPK-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{146} = \text{kpoff} \cdot \text{S\_1\_1\_m1} \tag{292}$$

Table 446: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpoff			0.05		☑

5.147 Reaction `Reaction147`

This is an irreversible reaction of two reactants forming one product.

Name binding of MEK-P on scaffold

Reaction equation

$$\text{K\_2\_1} + \text{S\_1\_m1\_0} \longrightarrow \text{S\_1\_1\_0} \tag{293}$$
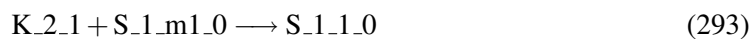
Reactants

Table 447: Properties of each reactant.

Id	Name	SBO
K_2_1	MEK-P	
S_1_m1_0	Scaffold_MAPK-P_RAF	

Product

Table 448: Properties of each product.

Id	Name	SBO
S_1_1_0	Scaffold_MAPK-P_MEK-P_RAF	

Kinetic Law

Derived unit contains undeclared units

$$v_{147} = \text{kpon} \cdot \text{K\_2\_1} \cdot \text{S\_1\_m1\_0} \tag{294}$$

Table 449: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpon			0.0		☑

5.148 Reaction `Reaction148`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of MEK-P from scaffold

Reaction equation

$$\text{S\_1\_1\_0} \longrightarrow \text{K\_2\_1} + \text{S\_1\_m1\_0} \tag{295}$$
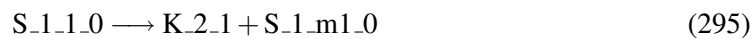
Reactant

Table 450: Properties of each reactant.

Id	Name	SBO
S_1_1_0	Scaffold_MAPK-P_MEK-P_RAF	

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Products

Table 451: Properties of each product.

Id	Name	SBO
K_2_1	MEK-P	
S_1_m1_0	Scaffold_MAPK-P_RAF	

Kinetic Law

Derived unit contains undeclared units

$$v_{148} = \text{kpoff} \cdot \text{S\_1\_1\_0} \tag{296}$$

Table 452: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpoff			0.05		☑

5.149 Reaction `Reaction149`

This is an irreversible reaction of two reactants forming one product.

Name binding of MEK-P on scaffold

Reaction equation

$$\text{K\_2\_1} + \text{S\_1\_m1\_1} \longrightarrow \text{S\_1\_1\_1} \tag{297}$$
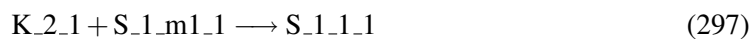
Reactants

Table 453: Properties of each reactant.

Id	Name	SBO
K_2_1	MEK-P	
S_1_m1_1	Scaffold_MAPK-P_RAF-P	

Product

Table 454: Properties of each product.

Id	Name	SBO
S_1_1_1	Scaffold_MAPK-P_MEK-P_RAF-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{149} = \text{kpon} \cdot \text{K\_2\_1} \cdot \text{S\_1\_m1\_1} \tag{298}$$

Table 455: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpon			0.0		☑

5.150 Reaction `Reaction150`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of MEK-P from scaffold

Reaction equation

$$\text{S\_1\_1\_1} \longrightarrow \text{K\_2\_1} + \text{S\_1\_m1\_1} \tag{299}$$
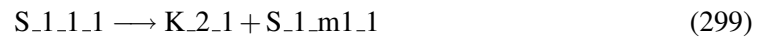
Reactant

Table 456: Properties of each reactant.

Id	Name	SBO
S_1_1_1	Scaffold_MAPK-P_MEK-P_RAF-P	

Products

Table 457: Properties of each product.

Id	Name	SBO
K_2_1	MEK-P	
S_1_m1_1	Scaffold_MAPK-P_RAF-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{150} = \text{kpoff} \cdot \text{S\_1\_1\_1} \tag{300}$$

Table 458: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpoff			0.05		☑

5.151 Reaction `Reaction151`

This is an irreversible reaction of two reactants forming one product.

Name binding of MEK-PP on scaffold

Reaction equation

$$\text{K\_2\_2} + \text{S\_1\_m1\_m1} \longrightarrow \text{S\_1\_2\_m1} \tag{301}$$
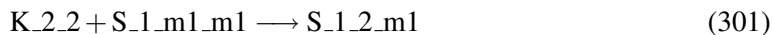
Reactants

Table 459: Properties of each reactant.

Id	Name	SBO
K_2_2	MEK-PP	
S_1_m1_m1	Scaffold_MAPK-P	

Product

Table 460: Properties of each product.

Id	Name	SBO
S_1_2_m1	Scaffold_MAPK-P_MEK-PP	

Kinetic Law

Derived unit contains undeclared units

$$v_{151} = \text{kpon} \cdot \text{K\_2\_2} \cdot \text{S\_1\_m1\_m1} \tag{302}$$

Table 461: Properties of each parameter.

| Id	Name	SBO	Value	Unit	Constant
kpon			0.0		☑

5.152 Reaction `Reaction152`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of MEK-PP from scaffold

Reaction equation

$$S\_1\_2\_m1 \longrightarrow K\_2\_2 + S\_1\_m1\_m1 \tag{303}$$
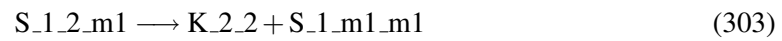
Reactant

Table 462: Properties of each reactant.

Id	Name	SBO
S_1_2_m1	Scaffold_MAPK-P_MEK-PP	

Products

Table 463: Properties of each product.

Id	Name	SBO
K_2_2	MEK-PP	
S_1_m1_m1	Scaffold_MAPK-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{152} = \mathrm{kpoff} \cdot S\_1\_2\_m1 \tag{304}$$

Table 464: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpoff			0.05		☑

5.153 Reaction `Reaction153`

This is an irreversible reaction of two reactants forming one product.

Name binding of MEK-PP on scaffold

Reaction equation

$$K\_2\_2 + S\_1\_m1\_0 \longrightarrow S\_1\_2\_0 \tag{305}$$
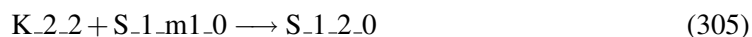
Reactants

Table 465: Properties of each reactant.

Id	Name	SBO
K_2_2	MEK-PP	
S_1_m1_0	Scaffold_MAPK-P_RAF	

Product

Table 466: Properties of each product.

Id	Name	SBO
S_1_2_0	Scaffold_MAPK-P_MEK-PP_RAF	

Kinetic Law

Derived unit contains undeclared units

$$v_{153} = \text{kpon} \cdot K\_2\_2 \cdot S\_1\_m1\_0 \tag{306}$$

Table 467: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpon			0.0		☑

5.154 Reaction `Reaction154`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of MEK-PP from scaffold

Reaction equation

$$S\_1\_2\_0 \longrightarrow K\_2\_2 + S\_1\_m1\_0 \qquad (307)$$
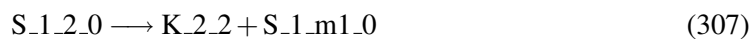
Reactant

Table 468: Properties of each reactant.

Id	Name	SBO
S_1_2_0	Scaffold_MAPK-P_MEK-PP_RAF	

Products

Table 469: Properties of each product.

Id	Name	SBO
K_2_2	MEK-PP	
S_1_m1_0	Scaffold_MAPK-P_RAF	

Kinetic Law

Derived unit contains undeclared units

$$v_{154} = \text{kpoff} \cdot S\_1\_2\_0 \qquad (308)$$

Table 470: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpoff			0.05		☑

5.155 Reaction `Reaction155`

This is an irreversible reaction of two reactants forming one product.

Name binding of MEK-PP on scaffold

Reaction equation

$$K\_2\_2 + S\_1\_m1\_1 \longrightarrow S\_1\_2\_1 \qquad (309)$$

Reactants

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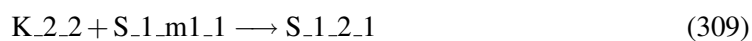
Table 471: Properties of each reactant.

Id	Name	SBO
K_2_2	MEK-PP	
S_1_m1_1	Scaffold_MAPK-P_RAF-P	

Product

Table 472: Properties of each product.

Id	Name	SBO
S_1_2_1	Scaffold_MAPK-P_MEK-PP_RAF-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{155} = \text{kpon} \cdot \text{K\_2\_2} \cdot \text{S\_1\_m1\_1} \tag{310}$$

Table 473: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpon			0.0		☑

5.156 Reaction `Reaction156`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of MEK-PP from scaffold

Reaction equation

$$\text{S\_1\_2\_1} \longrightarrow \text{K\_2\_2} + \text{S\_1\_m1\_1} \tag{311}$$
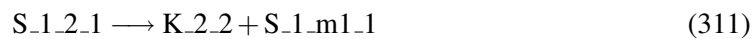
Reactant

Table 474: Properties of each reactant.

Id	Name	SBO
S_1_2_1	Scaffold_MAPK-P_MEK-PP_RAF-P	

Products

Table 475: Properties of each product.

Id	Name	SBO
K_2_2	MEK-PP	
S_1_m1_1	Scaffold_MAPK-P_RAF-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{156} = \text{kpoff} \cdot \text{S\_1\_2\_1} \tag{312}$$

Table 476: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpoff			0.05		☑

5.157 Reaction `Reaction157`

This is an irreversible reaction of two reactants forming one product.

Name binding of MEK on scaffold

Reaction equation

$$\text{K\_2\_0} + \text{S\_2\_m1\_m1} \longrightarrow \text{S\_2\_0\_m1} \tag{313}$$
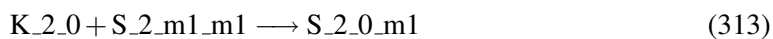
Reactants

Table 477: Properties of each reactant.

Id	Name	SBO
K_2_0	MEK	
S_2_m1_m1	Scaffold_MAPK-PP	

Product

Table 478: Properties of each product.

Id	Name	SBO
S_2_0_m1	Scaffold_MAPK-PP_MEK	

Kinetic Law

Derived unit contains undeclared units

$$v_{157} = \text{kon} \cdot \text{K\_2\_0} \cdot \text{S\_2\_m1\_m1} \tag{314}$$

Table 479: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kon			10.0		☑

5.158 Reaction `Reaction158`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of MEK from scaffold

Reaction equation

$$\text{S\_2\_0\_m1} \longrightarrow \text{K\_2\_0} + \text{S\_2\_m1\_m1} \tag{315}$$
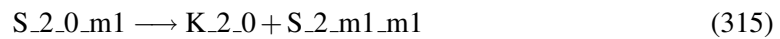
Reactant

Table 480: Properties of each reactant.

Id	Name	SBO
S_2_0_m1	Scaffold_MAPK-PP_MEK	

Products

Table 481: Properties of each product.

Id	Name	SBO
K_2_0	MEK	
S_2_m1_m1	Scaffold_MAPK-PP	

Kinetic Law

Derived unit contains undeclared units

$$v_{158} = \text{koff} \cdot \text{S\_2\_0\_m1} \tag{316}$$

Table 482: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
koff			0.5		☑

5.159 Reaction `Reaction159`

This is an irreversible reaction of two reactants forming one product.

Name binding of MEK on scaffold

Reaction equation

$$\text{K\_2\_0} + \text{S\_2\_m1\_0} \longrightarrow \text{S\_2\_0\_0} \tag{317}$$
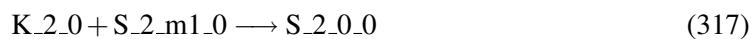
Reactants

Table 483: Properties of each reactant.

Id	Name	SBO
K_2_0	MEK	
S_2_m1_0	Scaffold_MAPK-PP_RAF	

Product

Table 484: Properties of each product.

Id	Name	SBO
S_2_0_0	Scaffold_MAPK-PP_MEK_RAF	

Kinetic Law

Derived unit contains undeclared units

$$v_{159} = \text{kon} \cdot \text{K\_2\_0} \cdot \text{S\_2\_m1\_0} \tag{318}$$

Table 485: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kon			10.0		☑

5.160 Reaction `Reaction160`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of MEK from scaffold

Reaction equation

$$S\_2\_0\_0 \longrightarrow K\_2\_0 + S\_2\_m1\_0 \qquad (319)$$
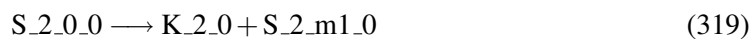
Reactant

Table 486: Properties of each reactant.

Id	Name	SBO
S_2_0_0	Scaffold_MAPK-PP_MEK_RAF	

Products

Table 487: Properties of each product.

Id	Name	SBO
K_2_0	MEK	
S_2_m1_0	Scaffold_MAPK-PP_RAF	

Kinetic Law

Derived unit contains undeclared units

$$v_{160} = \text{koff} \cdot S\_2\_0\_0 \qquad (320)$$

Table 488: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
koff			0.5		☑

5.161 Reaction `Reaction161`

This is an irreversible reaction of two reactants forming one product.

Name binding of MEK on scaffold

Reaction equation

$$K\_2\_0 + S\_2\_m1\_1 \longrightarrow S\_2\_0\_1 \tag{321}$$
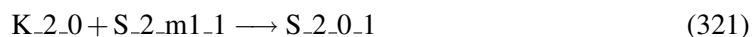
Reactants

Table 489: Properties of each reactant.

Id	Name	SBO
K_2_0	MEK	
S_2_m1_1	Scaffold_MAPK-PP_RAF-P	

Product

Table 490: Properties of each product.

Id	Name	SBO
S_2_0_1	Scaffold_MAPK-PP_MEK_RAF-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{161} = \text{kon} \cdot K\_2\_0 \cdot S\_2\_m1\_1 \tag{322}$$

Table 491: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kon			10.0		☑

5.162 Reaction `Reaction162`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of MEK from scaffold

Reaction equation

$$S\_2\_0\_1 \longrightarrow K\_2\_0 + S\_2\_m1\_1 \tag{323}$$
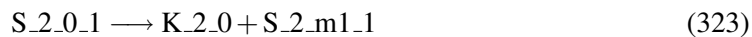
Reactant

Table 492: Properties of each reactant.

Id	Name	SBO
S_2_0_1	Scaffold_MAPK-PP_MEK_RAF-P	

Products

Table 493: Properties of each product.

Id	Name	SBO
K_2_0	MEK	
S_2_m1_1	Scaffold_MAPK-PP_RAF-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{162} = \text{koff} \cdot S\_2\_0\_1 \tag{324}$$

Table 494: Properties of each parameter.

| Id	Name	SBO	Value	Unit	Constant
koff			0.5		☑

5.163 Reaction `Reaction163`

This is an irreversible reaction of two reactants forming one product.

Name binding of MEK-P on scaffold

Reaction equation

$$K\_2\_1 + S\_2\_m1\_m1 \longrightarrow S\_2\_1\_m1 \tag{325}$$
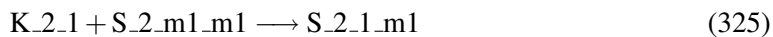
Reactants

Id	Name	SBO
K_2_1	MEK-P	
S_2_m1_m1	Scaffold_MAPK-PP	

Product

Table 496: Properties of each product.

Id	Name	SBO
S_2_1_m1	Scaffold_MAPK-PP_MEK-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{163} = \text{kpon} \cdot \text{K\_2\_1} \cdot \text{S\_2\_m1\_m1} \tag{326}$$

Table 497: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpon			0.0		☑

5.164 Reaction `Reaction164`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of MEK-P from scaffold

Reaction equation

$$\text{S\_2\_1\_m1} \longrightarrow \text{K\_2\_1} + \text{S\_2\_m1\_m1} \tag{327}$$
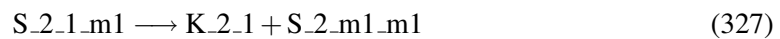
Reactant

Table 498: Properties of each reactant.

Id	Name	SBO
S_2_1_m1	Scaffold_MAPK-PP_MEK-P	

Products

Table 499: Properties of each product.

Id	Name	SBO
K_2_1	MEK-P	
S_2_m1_m1	Scaffold_MAPK-PP	

Kinetic Law

Derived unit contains undeclared units

$$v_{164} = \text{kpoff} \cdot \text{S\_2\_1\_m1} \tag{328}$$

Table 500: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpoff			0.05		☑

5.165 Reaction `Reaction165`

This is an irreversible reaction of two reactants forming one product.

Name binding of MEK-P on scaffold

Reaction equation

$$\text{K\_2\_1} + \text{S\_2\_m1\_0} \longrightarrow \text{S\_2\_1\_0} \tag{329}$$
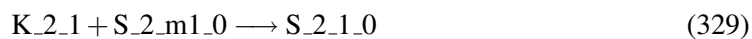
Reactants

Table 501: Properties of each reactant.

Id	Name	SBO
K_2_1	MEK-P	
S_2_m1_0	Scaffold_MAPK-PP_RAF	

Product

Table 502: Properties of each product.

Id	Name	SBO
S_2_1_0	Scaffold_MAPK-PP_MEK-P_RAF	

Kinetic Law

Derived unit contains undeclared units

$$v_{165} = \text{kpon} \cdot \text{K\_2\_1} \cdot \text{S\_2\_m1\_0} \tag{330}$$

Table 503: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpon			0.0		✔

5.166 Reaction `Reaction166`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of MEK-P from scaffold

Reaction equation

$$\text{S\_2\_1\_0} \longrightarrow \text{K\_2\_1} + \text{S\_2\_m1\_0} \tag{331}$$
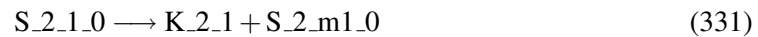
Reactant

Table 504: Properties of each reactant.

Id	Name	SBO
S_2_1_0	Scaffold_MAPK-PP_MEK-P_RAF	

Products

Table 505: Properties of each product.

Id	Name	SBO
K_2_1	MEK-P	
S_2_m1_0	Scaffold_MAPK-PP_RAF	

Kinetic Law

Derived unit contains undeclared units

$$v_{166} = \text{kpoff} \cdot \text{S\_2\_1\_0} \tag{332}$$

Table 506: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpoff			0.05		☑

5.167 Reaction `Reaction167`

This is an irreversible reaction of two reactants forming one product.

Name binding of MEK-P on scaffold

Reaction equation

$$\text{K\_2\_1} + \text{S\_2\_m1\_1} \longrightarrow \text{S\_2\_1\_1} \tag{333}$$
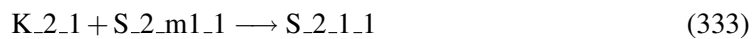
Reactants

Table 507: Properties of each reactant.

Id	Name	SBO
K_2_1	MEK-P	
S_2_m1_1	Scaffold_MAPK-PP_RAF-P	

Product

Table 508: Properties of each product.

Id	Name	SBO
S_2_1_1	Scaffold_MAPK-PP_MEK-P_RAF-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{167} = \text{kpon} \cdot \text{K\_2\_1} \cdot \text{S\_2\_m1\_1} \tag{334}$$

Table 509: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpon			0.0		☑

5.168 Reaction `Reaction168`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of MEK-P from scaffold

Reaction equation

$$S\_2\_1\_1 \longrightarrow K\_2\_1 + S\_2\_m1\_1 \tag{335}$$
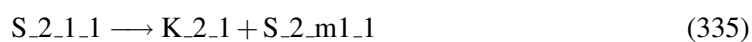
Reactant

Table 510: Properties of each reactant.

Id	Name	SBO
S_2_1_1	Scaffold_MAPK-PP_MEK-P_RAF-P	

Products

Table 511: Properties of each product.

Id	Name	SBO
K_2_1	MEK-P	
S_2_m1_1	Scaffold_MAPK-PP_RAF-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{168} = \text{kpoff} \cdot S\_2\_1\_1 \tag{336}$$

Table 512: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpoff			0.05		☑

5.169 Reaction `Reaction169`

This is an irreversible reaction of two reactants forming one product.

Name binding of MEK-PP on scaffold

Reaction equation

$$K\_2\_2 + S\_2\_m1\_m1 \longrightarrow S\_2\_2\_m1 \tag{337}$$
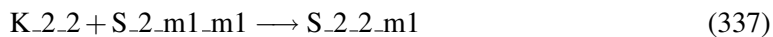
Reactants

Table 513: Properties of each reactant.

Id	Name	SBO
K_2_2	MEK-PP	
S_2_m1_m1	Scaffold_MAPK-PP	

Product

Table 514: Properties of each product.

Id	Name	SBO
S_2_2_m1	Scaffold_MAPK-PP_MEK-PP	

Kinetic Law

Derived unit contains undeclared units

$$v_{169} = \text{kpon} \cdot K\_2\_2 \cdot S\_2\_m1\_m1 \tag{338}$$

Table 515: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpon			0.0		☑

5.170 Reaction `Reaction170`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of MEK-PP from scaffold

Reaction equation

$$S\_2\_2\_m1 \longrightarrow K\_2\_2 + S\_2\_m1\_m1 \tag{339}$$
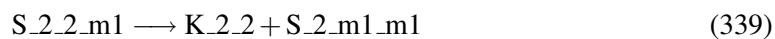
Reactant

Table 516: Properties of each reactant.

Id	Name	SBO
S_2_2_m1	Scaffold_MAPK-PP_MEK-PP	

Products

Table 517: Properties of each product.

Id	Name	SBO
K_2_2	MEK-PP	
S_2_m1_m1	Scaffold_MAPK-PP	

Kinetic Law

Derived unit contains undeclared units

$$v_{170} = \text{kpoff} \cdot S\_2\_2\_m1 \tag{340}$$

Table 518: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpoff			0.05		☑

5.171 Reaction `Reaction171`

This is an irreversible reaction of two reactants forming one product.

Name binding of MEK-PP on scaffold

Reaction equation

$$K\_2\_2 + S\_2\_m1\_0 \longrightarrow S\_2\_2\_0 \tag{341}$$
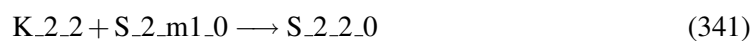
Reactants

Table 519: Properties of each reactant.

Id	Name	SBO
K_2_2	MEK-PP	
S_2_m1_0	Scaffold_MAPK-PP_RAF	

Product

Table 520: Properties of each product.

Id	Name	SBO
S_2_2_0	Scaffold_MAPK-PP_MEK-PP_RAF	

Kinetic Law

Derived unit contains undeclared units

$$v_{171} = \text{kpon} \cdot \text{K\_2\_2} \cdot \text{S\_2\_m1\_0} \tag{342}$$

Table 521: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpon			0.0		☑

5.172 Reaction `Reaction172`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of MEK-PP from scaffold

Reaction equation

$$\text{S\_2\_2\_0} \longrightarrow \text{K\_2\_2} + \text{S\_2\_m1\_0} \tag{343}$$
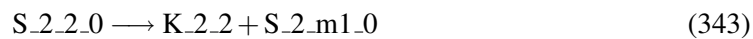
Reactant

Table 522: Properties of each reactant.

Id	Name	SBO
S_2_2_0	Scaffold_MAPK-PP_MEK-PP_RAF	

Products

Table 523: Properties of each product.

Id	Name	SBO
K_2_2	MEK-PP	
S_2_m1_0	Scaffold_MAPK-PP_RAF	

Kinetic Law

Derived unit contains undeclared units

$$v_{172} = \text{kpoff} \cdot \text{S\_2\_2\_0} \tag{344}$$

Table 524: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpoff			0.05		☑

5.173 Reaction `Reaction173`

This is an irreversible reaction of two reactants forming one product.

Name binding of MEK-PP on scaffold

Reaction equation

$$\text{K\_2\_2} + \text{S\_2\_m1\_1} \longrightarrow \text{S\_2\_2\_1} \tag{345}$$
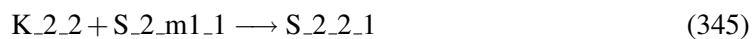
Reactants

Table 525: Properties of each reactant.

Id	Name	SBO
K_2_2	MEK-PP	
S_2_m1_1	Scaffold_MAPK-PP_RAF-P	

Product

Table 526: Properties of each product.

Id	Name	SBO
S_2_2_1	Scaffold_MAPK-PP_MEK-PP_RAF-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{173} = \text{kpon} \cdot \text{K\_2\_2} \cdot \text{S\_2\_m1\_1} \tag{346}$$

### Table 527: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpon			0.0		✓

5.174 Reaction `Reaction174`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of MEK-PP from scaffold

Reaction equation

$$\text{S\_2\_2\_1} \longrightarrow \text{K\_2\_2} + \text{S\_2\_m1\_1} \tag{347}$$
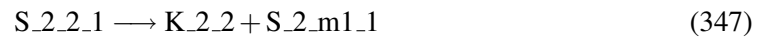
Reactant

Table 528: Properties of each reactant.

Id	Name	SBO
S_2_2_1	Scaffold_MAPK-PP_MEK-PP_RAF-P	

Products

Table 529: Properties of each product.

Id	Name	SBO
K_2_2	MEK-PP	
S_2_m1_1	Scaffold_MAPK-PP_RAF-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{174} = \text{kpoff} \cdot \text{S\_2\_2\_1} \tag{348}$$

Table 530: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpoff			0.05		✓

5.175 Reaction `Reaction175`

This is an irreversible reaction of two reactants forming one product.

Name binding of RAF on scaffold

Reaction equation

$$\text{K\_3\_0} + \text{S\_m1\_m1\_m1} \longrightarrow \text{S\_m1\_m1\_0} \tag{349}$$
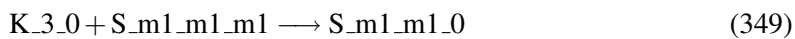
Reactants

Table 531: Properties of each reactant.

Id	Name	SBO
K_3_0	RAF	
S_m1_m1_m1	Scaffold	

Product

Table 532: Properties of each product.

Id	Name	SBO
S_m1_m1_0	Scaffold_RAF	

Kinetic Law

Derived unit contains undeclared units

$$v_{175} = \text{kon} \cdot \text{K\_3\_0} \cdot \text{S\_m1\_m1\_m1} \tag{350}$$

Table 533: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kon			10.0		☑

5.176 Reaction `Reaction176`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of RAF from scaffold

Reaction equation

$$S\_m1\_m1\_0 \longrightarrow K\_3\_0 + S\_m1\_m1\_m1 \tag{351}$$
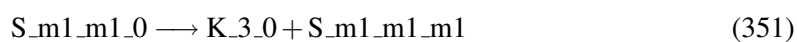
Reactant

Table 534: Properties of each reactant.

Id	Name	SBO
S_m1_m1_0	Scaffold_RAF	

Products

Table 535: Properties of each product.

Id	Name	SBO
K_3_0	RAF	
S_m1_m1_m1	Scaffold	

Kinetic Law

Derived unit contains undeclared units

$$v_{176} = \text{koff} \cdot S\_m1\_m1\_0 \tag{352}$$

Table 536: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
koff			0.5		☑

5.177 Reaction `Reaction177`

This is an irreversible reaction of two reactants forming one product.

Name binding of RAF-P on scaffold

Reaction equation

$$K\_3\_1 + S\_m1\_m1\_m1 \longrightarrow S\_m1\_m1\_1 \qquad (353)$$
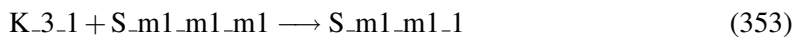
Reactants

Table 537: Properties of each reactant.

Id	Name	SBO
K_3_1	RAF-P	
S_m1_m1_m1	Scaffold	

Product

Table 538: Properties of each product.

Id	Name	SBO
S_m1_m1_1	Scaffold_RAF-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{177} = \text{kpon} \cdot \text{K}\_3\_1 \cdot \text{S}\_m1\_m1\_m1 \qquad (354)$$

Table 539: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpon			0.0		☑

5.178 Reaction `Reaction178`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of RAF-P from scaffold

Reaction equation

$$S\_m1\_m1\_1 \longrightarrow K\_3\_1 + S\_m1\_m1\_m1 \tag{355}$$
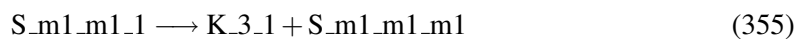
Reactant

Table 540: Properties of each reactant.

Id	Name	SBO
S_m1_m1_1	Scaffold_RAF-P	

Products

Table 541: Properties of each product.

Id	Name	SBO
K_3_1	RAF-P	
S_m1_m1_m1	Scaffold	

Kinetic Law

Derived unit contains undeclared units

$$v_{178} = \text{kpoff} \cdot S\_m1\_m1\_1 \tag{356}$$

Table 542: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpoff			0.05		☑

5.179 Reaction `Reaction179`

This is an irreversible reaction of two reactants forming one product.

Name binding of RAF on scaffold

Reaction equation

$$K\_3\_0 + S\_m1\_0\_m1 \longrightarrow S\_m1\_0\_0 \tag{357}$$
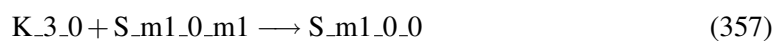
Reactants

Table 543: Properties of each reactant.

Id	Name	SBO
K_3_0	RAF	
S_m1_0_m1	Scaffold_MEK	

Product

Table 544: Properties of each product.

Id	Name	SBO
S_m1_0_0	Scaffold_MEK_RAF	

Kinetic Law

Derived unit contains undeclared units

$$v_{179} = \text{kon} \cdot \text{K\_3\_0} \cdot \text{S\_m1\_0\_m1} \tag{358}$$

Table 545: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kon			10.0		☑

5.180 Reaction `Reaction180`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of RAF from scaffold

Reaction equation

$$\text{S\_m1\_0\_0} \longrightarrow \text{K\_3\_0} + \text{S\_m1\_0\_m1} \tag{359}$$
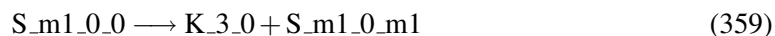
Reactant

Table 546: Properties of each reactant.

Id	Name	SBO
S_m1_0_0	Scaffold_MEK_RAF	

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Products

Table 547: Properties of each product.

Id	Name	SBO
K_3_0	RAF	
S_m1_0_m1	Scaffold_MEK	

Kinetic Law

Derived unit contains undeclared units

$$v_{180} = \text{koff} \cdot \text{S\_m1\_0\_0} \tag{360}$$

Table 548: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
koff			0.5		☑

5.181 Reaction `Reaction181`

This is an irreversible reaction of two reactants forming one product.

Name binding of RAF-P on scaffold

Reaction equation

$$\text{K\_3\_1} + \text{S\_m1\_0\_m1} \longrightarrow \text{S\_m1\_0\_1} \tag{361}$$
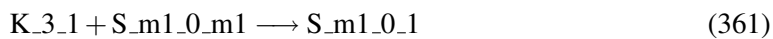
Reactants

Table 549: Properties of each reactant.

Id	Name	SBO
K_3_1	RAF-P	
S_m1_0_m1	Scaffold_MEK	

Product

Table 550: Properties of each product.

Id	Name	SBO
S_m1_0_1	Scaffold_MEK_RAF-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{181} = \text{kpon} \cdot \text{K\_3\_1} \cdot \text{S\_m1\_0\_m1} \tag{362}$$

Table 551: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpon			0.0		☑

5.182 Reaction `Reaction182`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of RAF-P from scaffold

Reaction equation

$$\text{S\_m1\_0\_1} \longrightarrow \text{K\_3\_1} + \text{S\_m1\_0\_m1} \tag{363}$$
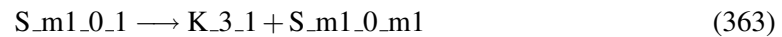
Reactant

Table 552: Properties of each reactant.

Id	Name	SBO
S_m1_0_1	Scaffold_MEK_RAF-P	

Products

Table 553: Properties of each product.

Id	Name	SBO
K_3_1	RAF-P	
S_m1_0_m1	Scaffold_MEK	

Kinetic Law

Derived unit contains undeclared units

$$v_{182} = \text{kpoff} \cdot \text{S\_m1\_0\_1} \tag{364}$$

Table 554: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpoff			0.05		☑

5.183 Reaction `Reaction183`

This is an irreversible reaction of two reactants forming one product.

Name binding of RAF on scaffold

Reaction equation

$$\text{K\_3\_0} + \text{S\_m1\_1\_m1} \longrightarrow \text{S\_m1\_1\_0} \tag{365}$$
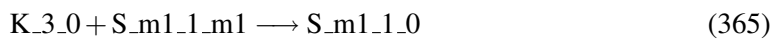
Reactants

Table 555: Properties of each reactant.

Id	Name	SBO
K_3_0	RAF	
S_m1_1_m1	Scaffold_MEK-P	

Product

Table 556: Properties of each product.

Id	Name	SBO
S_m1_1_0	Scaffold_MEK-P_RAF	

Kinetic Law

Derived unit contains undeclared units

$$v_{183} = \text{kon} \cdot \text{K\_3\_0} \cdot \text{S\_m1\_1\_m1} \tag{366}$$

Table 557: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kon			10.0		☑

5.184 Reaction `Reaction184`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of RAF from scaffold

Reaction equation

$$S\_m1\_1\_0 \longrightarrow K\_3\_0 + S\_m1\_1\_m1 \tag{367}$$
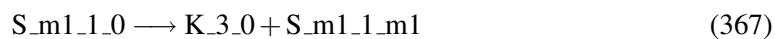
Reactant

Table 558: Properties of each reactant.

Id	Name	SBO
S_m1_1_0	Scaffold_MEK-P_RAF	

Products

Table 559: Properties of each product.

Id	Name	SBO
K_3_0	RAF	
S_m1_1_m1	Scaffold_MEK-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{184} = \text{koff} \cdot S\_m1\_1\_0 \tag{368}$$

Table 560: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
koff			0.5		☑

5.185 Reaction `Reaction185`

This is an irreversible reaction of two reactants forming one product.

Name binding of RAF-P on scaffold

Reaction equation

$$K\_3\_1 + S\_m1\_1\_m1 \longrightarrow S\_m1\_1\_1 \tag{369}$$
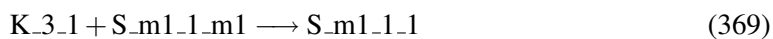
Reactants

Table 561: Properties of each reactant.

Id	Name	SBO
K_3_1	RAF-P	
S_m1_1_m1	Scaffold_MEK-P	

Product

Table 562: Properties of each product.

Id	Name	SBO
S_m1_1_1	Scaffold_MEK-P_RAF-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{185} = \text{kpon} \cdot K\_3\_1 \cdot S\_m1\_1\_m1 \tag{370}$$

Table 563: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpon			0.0		☑

5.186 Reaction `Reaction186`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of RAF-P from scaffold

Reaction equation

$$S\_m1\_1\_1 \longrightarrow K\_3\_1 + S\_m1\_1\_m1 \tag{371}$$
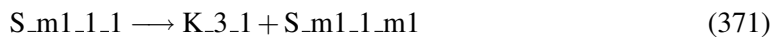
Reactant

Table 564: Properties of each reactant.

Id	Name	SBO
S_m1_1_1	Scaffold_MEK-P_RAF-P	

Products

Table 565: Properties of each product.

Id	Name	SBO
K_3_1	RAF-P	
S_m1_1_m1	Scaffold_MEK-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{186} = \text{kpoff} \cdot S\_m1\_1\_1 \tag{372}$$

Table 566: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpoff			0.05		☑

5.187 Reaction `Reaction187`

This is an irreversible reaction of two reactants forming one product.

Name binding of RAF on scaffold

Reaction equation

$$K\_3\_0 + S\_m1\_2\_m1 \longrightarrow S\_m1\_2\_0 \tag{373}$$
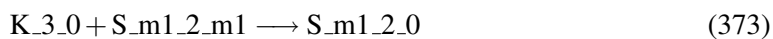
Reactants

Table 567: Properties of each reactant.

Id	Name	SBO
K_3_0	RAF	
S_m1_2_m1	Scaffold_MEK-PP	

Product

Table 568: Properties of each product.

Id	Name	SBO
S_m1_2_0	Scaffold_MEK-PP_RAF	

Kinetic Law

Derived unit contains undeclared units

$$v_{187} = \text{kon} \cdot \text{K\_3\_0} \cdot \text{S\_m1\_2\_m1} \tag{374}$$

Table 569: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kon			10.0		☑

5.188 Reaction `Reaction188`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of RAF from scaffold

Reaction equation

$$\text{S\_m1\_2\_0} \longrightarrow \text{K\_3\_0} + \text{S\_m1\_2\_m1} \tag{375}$$
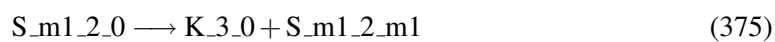
Reactant

Table 570: Properties of each reactant.

Id	Name	SBO
S_m1_2_0	Scaffold_MEK-PP_RAF	

Products

Table 571: Properties of each product.

Id	Name	SBO
K_3_0	RAF	
S_m1_2_m1	Scaffold_MEK-PP	

Kinetic Law

Derived unit contains undeclared units

$$v_{188} = \text{koff} \cdot \text{S\_m1\_2\_0} \tag{376}$$

Table 572: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
koff			0.5		✓

5.189 Reaction Reaction189

This is an irreversible reaction of two reactants forming one product.

Name binding of RAF-P on scaffold

Reaction equation

$$\text{K\_3\_1} + \text{S\_m1\_2\_m1} \longrightarrow \text{S\_m1\_2\_1} \tag{377}$$
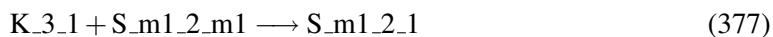
Reactants

Table 573: Properties of each reactant.

Id	Name	SBO
K_3_1	RAF-P	
S_m1_2_m1	Scaffold_MEK-PP	

Product

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Table 574: Properties of each product.

Id	Name	SBO
S_m1_2_1	Scaffold_MEK-PP_RAF-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{189} = \text{kpon} \cdot \text{K\_3\_1} \cdot \text{S\_m1\_2\_m1} \tag{378}$$

Table 575: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpon			0.0		☑

5.190 Reaction `Reaction190`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of RAF-P from scaffold

Reaction equation

$$\text{S\_m1\_2\_1} \longrightarrow \text{K\_3\_1} + \text{S\_m1\_2\_m1} \tag{379}$$
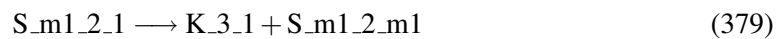
Reactant

Table 576: Properties of each reactant.

Id	Name	SBO
S_m1_2_1	Scaffold_MEK-PP_RAF-P	

Products

Table 577: Properties of each product.

Id	Name	SBO
K_3_1	RAF-P	
S_m1_2_m1	Scaffold_MEK-PP	

Kinetic Law

Derived unit contains undeclared units

$$v_{190} = \text{kpoff} \cdot \text{S\_m1\_2\_1} \tag{380}$$

Table 578: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpoff			0.05		☑

5.191 Reaction `Reaction191`

This is an irreversible reaction of two reactants forming one product.

Name binding of RAF on scaffold

Reaction equation

$$\text{K\_3\_0} + \text{S\_0\_m1\_m1} \longrightarrow \text{S\_0\_m1\_0} \tag{381}$$
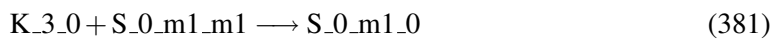
Reactants

Table 579: Properties of each reactant.

Id	Name	SBO
K_3_0	RAF	
S_0_m1_m1	Scaffold_MAPK	

Product

Table 580: Properties of each product.

Id	Name	SBO
S_0_m1_0	Scaffold_MAPK_RAF	

Kinetic Law

Derived unit contains undeclared units

$$v_{191} = \text{kon} \cdot \text{K\_3\_0} \cdot \text{S\_0\_m1\_m1} \tag{382}$$

Table 581: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kon			10.0		☑

5.192 Reaction `Reaction192`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of RAF from scaffold

Reaction equation

$$\text{S\_0\_m1\_0} \longrightarrow \text{K\_3\_0} + \text{S\_0\_m1\_m1} \tag{383}$$
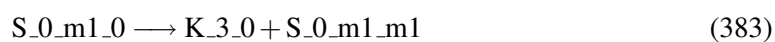
Reactant

Table 582: Properties of each reactant.

Id	Name	SBO
S_0_m1_0	Scaffold_MAPK_RAF	

Products

Table 583: Properties of each product.

Id	Name	SBO
K_3_0	RAF	
S_0_m1_m1	Scaffold_MAPK	

Kinetic Law

Derived unit contains undeclared units

$$v_{192} = \text{koff} \cdot \text{S\_0\_m1\_0} \tag{384}$$

Table 584: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
koff			0.5		☑

5.193 Reaction `Reaction193`

This is an irreversible reaction of two reactants forming one product.

Name binding of RAF-P on scaffold

Reaction equation

$$K\_3\_1 + S\_0\_m1\_m1 \longrightarrow S\_0\_m1\_1 \tag{385}$$
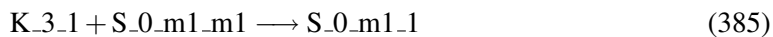
Reactants

Table 585: Properties of each reactant.

Id	Name	SBO
K_3_1	RAF-P	
S_0_m1_m1	Scaffold_MAPK	

Product

Table 586: Properties of each product.

Id	Name	SBO
S_0_m1_1	Scaffold_MAPK_RAF-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{193} = \text{kpon} \cdot K\_3\_1 \cdot S\_0\_m1\_m1 \tag{386}$$

Table 587: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpon			0.0		☑

5.194 Reaction `Reaction194`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of RAF-P from scaffold

Reaction equation

$$S\_0\_m1\_1 \longrightarrow K\_3\_1 + S\_0\_m1\_m1 \tag{387}$$
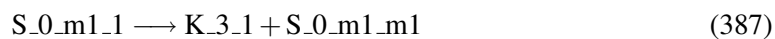
Reactant

Table 588: Properties of each reactant.

Id	Name	SBO
S_0_m1_1	Scaffold_MAPK_RAF-P	

Products

Table 589: Properties of each product.

Id	Name	SBO
K_3_1	RAF-P	
S_0_m1_m1	Scaffold_MAPK	

Kinetic Law

Derived unit contains undeclared units

$$v_{194} = \text{kpoff} \cdot \text{S\_0\_m1\_1} \tag{388}$$

Table 590: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpoff			0.05		☑

5.195 Reaction `Reaction195`

This is an irreversible reaction of two reactants forming one product.

Name binding of RAF on scaffold

Reaction equation

$$K\_3\_0 + S\_0\_0\_m1 \longrightarrow S\_0\_0\_0 \tag{389}$$
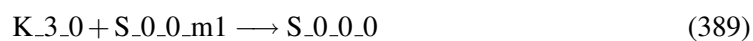
Reactants

Table 591: Properties of each reactant.

Id	Name	SBO
K_3_0	RAF	
S_0_0_m1	Scaffold_MAPK_MEK	

Product

Table 592: Properties of each product.

Id	Name	SBO
S_0_0_0	Scaffold_MAPK_MEK_RAF	

Kinetic Law

Derived unit contains undeclared units

$$v_{195} = \text{kon} \cdot \text{K\_3\_0} \cdot \text{S\_0\_0\_m1} \tag{390}$$

Table 593: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kon			10.0		☑

5.196 Reaction `Reaction196`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of RAF from scaffold

Reaction equation

$$S\_0\_0\_0 \longrightarrow K\_3\_0 + S\_0\_0\_m1 \tag{391}$$

Reactant

Table 594: Properties of each reactant.

Id	Name	SBO
S_0_0_0	Scaffold_MAPK_MEK_RAF	

Products

Table 595: Properties of each product.

Id	Name	SBO
K_3_0	RAF	
S_0_0_m1	Scaffold_MAPK_MEK	

Kinetic Law

Derived unit contains undeclared units

$$v_{196} = \text{koff} \cdot \text{S\_0\_0\_0} \tag{392}$$

Table 596: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
koff			0.5		☑

5.197 Reaction `Reaction197`

This is an irreversible reaction of two reactants forming one product.

Name binding of RAF-P on scaffold

Reaction equation

$$\text{K\_3\_1} + \text{S\_0\_0\_m1} \longrightarrow \text{S\_0\_0\_1} \tag{393}$$
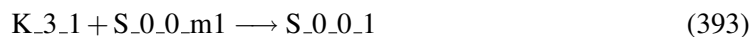
Reactants

Table 597: Properties of each reactant.

Id	Name	SBO
K_3_1	RAF-P	
S_0_0_m1	Scaffold_MAPK_MEK	

Product

Table 598: Properties of each product.

Id	Name	SBO
S_0_0_1	Scaffold_MAPK_MEK_RAF-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{197} = \text{kpon} \cdot \text{K\_3\_1} \cdot \text{S\_0\_0\_m1} \tag{394}$$

Table 599: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpon			0.0		✓

5.198 Reaction Reaction198

This is an irreversible reaction of one reactant forming two products.

Name dissociation of RAF from scaffold

Reaction equation

$$\text{S\_0\_0\_1} \longrightarrow \text{K\_3\_1} + \text{S\_0\_0\_m1} \tag{395}$$

Reactant

Table 600: Properties of each reactant.

Id	Name	SBO
S_0_0_1	Scaffold_MAPK_MEK_RAF-P	

Products

Table 601: Properties of each product.

Id	Name	SBO
K_3_1	RAF-P	
S_0_0_m1	Scaffold_MAPK_MEK	

Kinetic Law

Derived unit contains undeclared units

$$v_{198} = \text{kpoff} \cdot \text{S\_0\_0\_1} \tag{396}$$

Table 602: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpoff			0.05		☑

5.199 Reaction `Reaction199`

This is an irreversible reaction of two reactants forming one product.

Name binding of RAF on scaffold

Reaction equation

$$\text{K\_3\_0} + \text{S\_0\_1\_m1} \longrightarrow \text{S\_0\_1\_0} \tag{397}$$
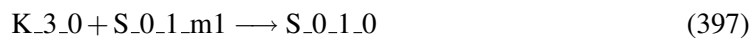
Reactants

Table 603: Properties of each reactant.

Id	Name	SBO
K_3_0	RAF	
S_0_1_m1	Scaffold_MAPK_MEK-P	

Product

Table 604: Properties of each product.

Id	Name	SBO
S_0_1_0	Scaffold_MAPK_MEK-P_RAF	

Kinetic Law

Derived unit contains undeclared units

$$v_{199} = \text{kon} \cdot \text{K\_3\_0} \cdot \text{S\_0\_1\_m1} \tag{398}$$

Table 605: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kon			10.0		☑

5.200 Reaction `Reaction200`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of RAF from scaffold

Reaction equation

$$S\_0\_1\_0 \longrightarrow K\_3\_0 + S\_0\_1\_m1 \tag{399}$$
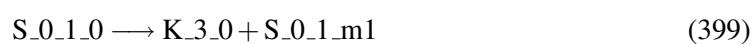
Reactant

Table 606: Properties of each reactant.

Id	Name	SBO
S_0_1_0	Scaffold_MAPK_MEK-P_RAF	

Products

Table 607: Properties of each product.

Id	Name	SBO
K_3_0	RAF	
S_0_1_m1	Scaffold_MAPK_MEK-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{200} = \text{koff} \cdot S\_0\_1\_0 \tag{400}$$

Table 608: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
koff			0.5		☑

5.201 Reaction `Reaction201`

This is an irreversible reaction of two reactants forming one product.

Name binding of RAF-P on scaffold

Reaction equation

$$K\_3\_1 + S\_0\_1\_m1 \longrightarrow S\_0\_1\_1 \tag{401}$$
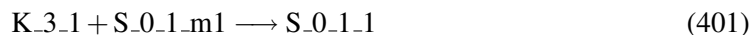
Reactants

Table 609: Properties of each reactant.

Id	Name	SBO
K_3_1	RAF-P	
S_0_1_m1	Scaffold_MAPK_MEK-P	

Product

Table 610: Properties of each product.

Id	Name	SBO
S_0_1_1	Scaffold_MAPK_MEK-P_RAF-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{201} = \text{kpon} \cdot K\_3\_1 \cdot S\_0\_1\_m1 \tag{402}$$

Table 611: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpon			0.0		✓

5.202 Reaction `Reaction202`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of RAF-P from scaffold

Reaction equation

$$S\_0\_1\_1 \longrightarrow K\_3\_1 + S\_0\_1\_m1 \tag{403}$$

Reactant

Table 612: Properties of each reactant.

Id	Name	SBO
S_0_1_1	Scaffold_MAPK_MEK-P_RAF-P	

Products

Table 613: Properties of each product.

Id	Name	SBO
K_3_1	RAF-P	
S_0_1_m1	Scaffold_MAPK_MEK-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{202} = \text{kpoff} \cdot S\_0\_1\_1 \tag{404}$$

Table 614: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpoff			0.05		☑

5.203 Reaction `Reaction203`

This is an irreversible reaction of two reactants forming one product.

Name binding of RAF on scaffold

Reaction equation

$$K\_3\_0 + S\_0\_2\_m1 \longrightarrow S\_0\_2\_0 \tag{405}$$

Reactants

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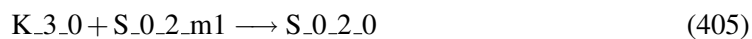
Table 615: Properties of each reactant.

Id	Name	SBO
K_3_0	RAF	
S_0_2_m1	Scaffold_MAPK_MEK-PP	

Product

Table 616: Properties of each product.

Id	Name	SBO
S_0_2_0	Scaffold_MAPK_MEK-PP_RAF	

Kinetic Law

Derived unit contains undeclared units

$$v_{203} = \text{kon} \cdot \text{K\_3\_0} \cdot \text{S\_0\_2\_m1} \tag{406}$$

Table 617: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kon			10.0		☑

5.204 Reaction `Reaction204`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of RAF from scaffold

Reaction equation

$$\text{S\_0\_2\_0} \longrightarrow \text{K\_3\_0} + \text{S\_0\_2\_m1} \tag{407}$$

Reactant

Table 618: Properties of each reactant.

Id	Name	SBO
S_0_2_0	Scaffold_MAPK_MEK-PP_RAF	

Products

Table 619: Properties of each product.

Id	Name	SBO
K_3_0	RAF	
S_0_2_m1	Scaffold_MAPK_MEK-PP	

Kinetic Law

Derived unit contains undeclared units

$$v_{204} = \text{koff} \cdot \text{S\_0\_2\_0} \tag{408}$$

Table 620: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
koff			0.5		☑

5.205 Reaction `Reaction205`

This is an irreversible reaction of two reactants forming one product.

Name binding of RAF-P on scaffold

Reaction equation

$$\text{K\_3\_1} + \text{S\_0\_2\_m1} \longrightarrow \text{S\_0\_2\_1} \tag{409}$$

Reactants

Table 621: Properties of each reactant.

Id	Name	SBO
K_3_1	RAF-P	
S_0_2_m1	Scaffold_MAPK_MEK-PP	

Product

Table 622: Properties of each product.

Id	Name	SBO
S_0_2_1	Scaffold_MAPK_MEK-PP_RAF-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{205} = \text{kpon} \cdot \text{K\_3\_1} \cdot \text{S\_0\_2\_m1} \tag{410}$$

Table 623: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpon			0.0		☑

5.206 Reaction `Reaction206`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of RAF-P from scaffold

Reaction equation

$$\text{S\_0\_2\_1} \longrightarrow \text{K\_3\_1} + \text{S\_0\_2\_m1} \tag{411}$$

Reactant

Table 624: Properties of each reactant.

Id	Name	SBO
S_0_2_1	Scaffold_MAPK_MEK-PP_RAF-P	

Products

Table 625: Properties of each product.

Id	Name	SBO
K_3_1	RAF-P	
S_0_2_m1	Scaffold_MAPK_MEK-PP	

Kinetic Law

Derived unit contains undeclared units

$$v_{206} = \text{kpoff} \cdot \text{S\_0\_2\_1} \tag{412}$$

Table 626: Properties of each parameter.

| Id	Name	SBO	Value	Unit	Constant
kpoff			0.05		☑

5.207 Reaction `Reaction207`

This is an irreversible reaction of two reactants forming one product.

Name binding of RAF on scaffold

Reaction equation

$$\text{K\_3\_0} + \text{S\_1\_m1\_m1} \longrightarrow \text{S\_1\_m1\_0} \tag{413}$$

Reactants

Table 627: Properties of each reactant.

Id	Name	SBO
K_3_0	RAF	
S_1_m1_m1	Scaffold_MAPK-P	

Product

Table 628: Properties of each product.

Id	Name	SBO
S_1_m1_0	Scaffold_MAPK-P_RAF	

Kinetic Law

Derived unit contains undeclared units

$$v_{207} = \text{kon} \cdot \text{K\_3\_0} \cdot \text{S\_1\_m1\_m1} \tag{414}$$

Table 629: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kon			10.0		☑

5.208 Reaction `Reaction208`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of RAF from scaffold

Reaction equation

$$S\_1\_m1\_0 \longrightarrow K\_3\_0 + S\_1\_m1\_m1 \tag{415}$$

Reactant

Table 630: Properties of each reactant.

Id	Name	SBO
S_1_m1_0	Scaffold_MAPK-P_RAF	

Products

Table 631: Properties of each product.

Id	Name	SBO
K_3_0	RAF	
S_1_m1_m1	Scaffold_MAPK-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{208} = \text{koff} \cdot S\_1\_m1\_0 \tag{416}$$
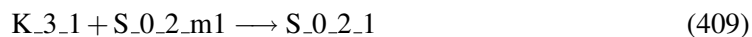
Table 632: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
koff			0.5		☑

5.209 Reaction `Reaction209`

This is an irreversible reaction of two reactants forming one product.

Name binding of RAF-P on scaffold

Reaction equation

$$K\_3\_1 + S\_1\_m1\_m1 \longrightarrow S\_1\_m1\_1 \tag{417}$$

Reactants

Table 633: Properties of each reactant.

Id	Name	SBO
K_3_1	RAF-P	
S_1_m1_m1	Scaffold_MAPK-P	

Product

Table 634: Properties of each product.

Id	Name	SBO
S_1_m1_1	Scaffold_MAPK-P_RAF-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{209} = \text{kpon} \cdot K\_3\_1 \cdot S\_1\_m1\_m1 \tag{418}$$

Table 635: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpon			0.0		☑

5.210 Reaction `Reaction210`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of RAF-P from scaffold

Reaction equation

$$S\_1\_m1\_1 \longrightarrow K\_3\_1 + S\_1\_m1\_m1 \tag{419}$$
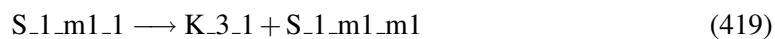
Reactant

Table 636: Properties of each reactant.

Id	Name	SBO
S_1_m1_1	Scaffold_MAPK-P_RAF-P	

Products

Table 637: Properties of each product.

Id	Name	SBO
K_3_1	RAF-P	
S_1_m1_m1	Scaffold_MAPK-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{210} = \text{kpoff} \cdot \text{S\_1\_m1\_1} \tag{420}$$

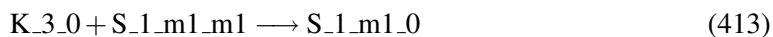Table 638: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpoff			0.05		☑

5.211 Reaction `Reaction211`

This is an irreversible reaction of two reactants forming one product.

Name binding of RAF on scaffold

Reaction equation

$$K\_3\_0 + S\_1\_0\_m1 \longrightarrow S\_1\_0\_0 \tag{421}$$

Reactants

Table 639: Properties of each reactant.

Id	Name	SBO
K_3_0	RAF	
S_1_0_m1	Scaffold_MAPK-P_MEK	

Product

Table 640: Properties of each product.

Id	Name	SBO
S_1_0_0	Scaffold_MAPK-P_MEK_RAF	

Kinetic Law

Derived unit contains undeclared units

$$v_{211} = \text{kon} \cdot \text{K\_3\_0} \cdot \text{S\_1\_0\_m1} \tag{422}$$

Table 641: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kon			10.0		☑

5.212 Reaction `Reaction212`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of RAF from scaffold

Reaction equation

$$\text{S\_1\_0\_0} \longrightarrow \text{K\_3\_0} + \text{S\_1\_0\_m1} \tag{423}$$

Reactant

Table 642: Properties of each reactant.

Id	Name	SBO
S_1_0_0	Scaffold_MAPK-P_MEK_RAF	

Products

Table 643: Properties of each product.

Id	Name	SBO
K_3_0	RAF	
S_1_0_m1	Scaffold_MAPK-P_MEK	

Kinetic Law

Derived unit contains undeclared units

$$v_{212} = \text{koff} \cdot \text{S\_1\_0\_0} \tag{424}$$
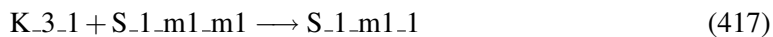
Table 644: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
koff			0.5		✓

5.213 Reaction `Reaction213`

This is an irreversible reaction of two reactants forming one product.

Name binding of RAF-P on scaffold

Reaction equation

$$\text{K\_3\_1} + \text{S\_1\_0\_m1} \longrightarrow \text{S\_1\_0\_1} \tag{425}$$

Reactants

Table 645: Properties of each reactant.

Id	Name	SBO
K_3_1	RAF-P	
S_1_0_m1	Scaffold_MAPK-P_MEK	

Product

Table 646: Properties of each product.

Id	Name	SBO
S_1_0_1	Scaffold_MAPK-P_MEK_RAF-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{213} = \text{kpon} \cdot \text{K\_3\_1} \cdot \text{S\_1\_0\_m1} \tag{426}$$

Table 647: Properties of each parameter.

| Id	Name	SBO	Value	Unit	Constant
kpon			0.0		☑

5.214 Reaction `Reaction214`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of RAF-P from scaffold

Reaction equation

$$\text{S\_1\_0\_1} \longrightarrow \text{K\_3\_1} + \text{S\_1\_0\_m1} \tag{427}$$

Reactant

Table 648: Properties of each reactant.

Id	Name	SBO
S_1_0_1	Scaffold_MAPK-P_MEK_RAF-P	

Products

Table 649: Properties of each product.

Id	Name	SBO
K_3_1	RAF-P	
S_1_0_m1	Scaffold_MAPK-P_MEK	

Kinetic Law

Derived unit contains undeclared units

$$v_{214} = \text{kpoff} \cdot \text{S\_1\_0\_1} \tag{428}$$
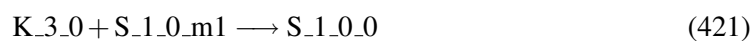
Table 650: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpoff			0.05		☑

5.215 Reaction `Reaction215`

This is an irreversible reaction of two reactants forming one product.

Name binding of RAF on scaffold

Reaction equation

$$\text{K\_3\_0} + \text{S\_1\_1\_m1} \longrightarrow \text{S\_1\_1\_0} \tag{429}$$

Reactants

Table 651: Properties of each reactant.

Id	Name	SBO
K_3_0	RAF	
S_1_1_m1	Scaffold_MAPK-P_MEK-P	

Product

Table 652: Properties of each product.

Id	Name	SBO
S_1_1_0	Scaffold_MAPK-P_MEK-P_RAF	

Kinetic Law

Derived unit contains undeclared units

$$v_{215} = \text{kon} \cdot \text{K\_3\_0} \cdot \text{S\_1\_1\_m1} \tag{430}$$

Table 653: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kon			10.0		☑

5.216 Reaction `Reaction216`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of RAF from scaffold

Reaction equation

$$S\_1\_1\_0 \longrightarrow K\_3\_0 + S\_1\_1\_m1 \tag{431}$$

Reactant

Table 654: Properties of each reactant.

Id	Name	SBO
S_1_1_0	Scaffold_MAPK-P_MEK-P_RAF	

Products

Table 655: Properties of each product.

Id	Name	SBO
K_3_0	RAF	
S_1_1_m1	Scaffold_MAPK-P_MEK-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{216} = \text{koff} \cdot S\_1\_1\_0 \tag{432}$$
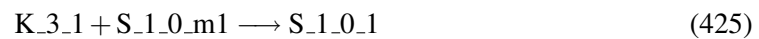
Table 656: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
koff			0.5		☑

5.217 Reaction `Reaction217`

This is an irreversible reaction of two reactants forming one product.

Name binding of RAF-P on scaffold

Reaction equation

$$K\_3\_1 + S\_1\_1\_m1 \longrightarrow S\_1\_1\_1 \tag{433}$$
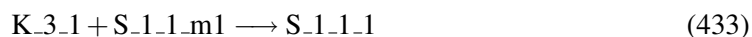
Reactants

Table 657: Properties of each reactant.

Id	Name	SBO
K_3_1	RAF-P	
S_1_1_m1	Scaffold_MAPK-P_MEK-P	

Product

Table 658: Properties of each product.

Id	Name	SBO
S_1_1_1	Scaffold_MAPK-P_MEK-P_RAF-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{217} = \text{kpon} \cdot K\_3\_1 \cdot S\_1\_1\_m1 \tag{434}$$

Table 659: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpon			0.0		☑

5.218 Reaction `Reaction218`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of RAF-P from scaffold

Reaction equation

$$S\_1\_1\_1 \longrightarrow K\_3\_1 + S\_1\_1\_m1 \qquad (435)$$

Reactant

Table 660: Properties of each reactant.

Id	Name	SBO
S_1_1_1	Scaffold_MAPK-P_MEK-P_RAF-P	

Products

Table 661: Properties of each product.

Id	Name	SBO
K_3_1	RAF-P	
S_1_1_m1	Scaffold_MAPK-P_MEK-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{218} = \text{kpoff} \cdot S\_1\_1\_1 \qquad (436)$$
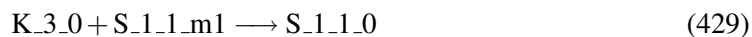
Table 662: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpoff			0.05		☑

5.219 Reaction `Reaction219`

This is an irreversible reaction of two reactants forming one product.

Name binding of RAF on scaffold

Reaction equation

$$K\_3\_0 + S\_1\_2\_m1 \longrightarrow S\_1\_2\_0 \qquad (437)$$

Reactants

Produced by SBML2LATEX
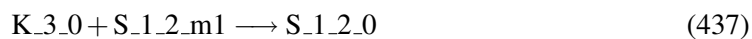
Table 663: Properties of each reactant.

Id	Name	SBO
K_3_0	RAF	
S_1_2_m1	Scaffold_MAPK-P_MEK-PP	

Product

Table 664: Properties of each product.

Id	Name	SBO
S_1_2_0	Scaffold_MAPK-P_MEK-PP_RAF	

Kinetic Law

Derived unit contains undeclared units

$$v_{219} = \text{kon} \cdot \text{K\_3\_0} \cdot \text{S\_1\_2\_m1} \tag{438}$$
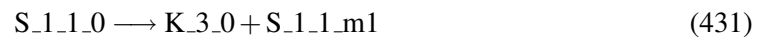
Table 665: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kon			10.0		☑

5.220 Reaction `Reaction220`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of RAF from scaffold

Reaction equation

$$\text{S\_1\_2\_0} \longrightarrow \text{K\_3\_0} + \text{S\_1\_2\_m1} \tag{439}$$

Reactant

Table 666: Properties of each reactant.

Id	Name	SBO
S_1_2_0	Scaffold_MAPK-P_MEK-PP_RAF	

Products

Table 667: Properties of each product.

Id	Name	SBO
K_3_0	RAF	
S_1_2_m1	Scaffold_MAPK-P_MEK-PP	

Kinetic Law

Derived unit contains undeclared units

$$v_{220} = \text{koff} \cdot \text{S\_1\_2\_0} \tag{440}$$

Table 668: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
koff			0.5		☑

5.221 Reaction `Reaction221`

This is an irreversible reaction of two reactants forming one product.

Name binding of RAF-P on scaffold

Reaction equation

$$\text{K\_3\_1} + \text{S\_1\_2\_m1} \longrightarrow \text{S\_1\_2\_1} \tag{441}$$

Reactants

Table 669: Properties of each reactant.

Id	Name	SBO
K_3_1	RAF-P	
S_1_2_m1	Scaffold_MAPK-P_MEK-PP	

Product

Produced by SBML2LATEX

Table 670: Properties of each product.

Id	Name	SBO
S_1_2_1	Scaffold_MAPK-P_MEK-PP_RAF-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{221} = \text{kpon} \cdot \text{K\_3\_1} \cdot \text{S\_1\_2\_m1} \tag{442}$$

Table 671: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpon			0.0		☑

5.222 Reaction Reaction222

This is an irreversible reaction of one reactant forming two products.

Name dissociation of RAF-P from scaffold

Reaction equation

$$\text{S\_1\_2\_1} \longrightarrow \text{K\_3\_1} + \text{S\_1\_2\_m1} \tag{443}$$

Reactant

Table 672: Properties of each reactant.

Id	Name	SBO
S_1_2_1	Scaffold_MAPK-P_MEK-PP_RAF-P	

Products

Table 673: Properties of each product.

Id	Name	SBO
K_3_1	RAF-P	
S_1_2_m1	Scaffold_MAPK-P_MEK-PP	

Kinetic Law

Derived unit contains undeclared units

$$v_{222} = \text{kpoff} \cdot \text{S\_1\_2\_1} \tag{444}$$
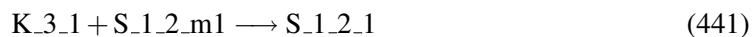
Table 674: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpoff			0.05		☑

5.223 Reaction `Reaction223`

This is an irreversible reaction of two reactants forming one product.

Name binding of RAF on scaffold

Reaction equation

$$\text{K\_3\_0} + \text{S\_2\_m1\_m1} \longrightarrow \text{S\_2\_m1\_0} \tag{445}$$
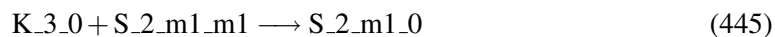
Reactants

Table 675: Properties of each reactant.

Id	Name	SBO
K_3_0	RAF	
S_2_m1_m1	Scaffold_MAPK-PP	

Product

Table 676: Properties of each product.

Id	Name	SBO
S_2_m1_0	Scaffold_MAPK-PP_RAF	

Kinetic Law

Derived unit contains undeclared units

$$v_{223} = \text{kon} \cdot \text{K\_3\_0} \cdot \text{S\_2\_m1\_m1} \tag{446}$$

Table 677: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kon			10.0		☑

5.224 Reaction `Reaction224`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of RAF from scaffold

Reaction equation

$$S\_2\_m1\_0 \longrightarrow K\_3\_0 + S\_2\_m1\_m1 \tag{447}$$

Reactant

Table 678: Properties of each reactant.

Id	Name	SBO
S_2_m1_0	Scaffold_MAPK-PP_RAF	

Products

Table 679: Properties of each product.

Id	Name	SBO
K_3_0	RAF	
S_2_m1_m1	Scaffold_MAPK-PP	

Kinetic Law

Derived unit contains undeclared units

$$v_{224} = \text{koff} \cdot S\_2\_m1\_0 \tag{448}$$

Table 680: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
koff			0.5		☑

5.225 Reaction `Reaction225`

This is an irreversible reaction of two reactants forming one product.

Name binding of RAF-P on scaffold

Reaction equation

$$K\_3\_1 + S\_2\_m1\_m1 \longrightarrow S\_2\_m1\_1 \tag{449}$$

Reactants

Table 681: Properties of each reactant.

Id	Name	SBO
K_3_1	RAF-P	
S_2_m1_m1	Scaffold_MAPK-PP	

Product

Table 682: Properties of each product.

Id	Name	SBO
S_2_m1_1	Scaffold_MAPK-PP_RAF-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{225} = \text{kpon} \cdot K\_3\_1 \cdot S\_2\_m1\_m1 \tag{450}$$

Table 683: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpon			0.0		☑

5.226 Reaction `Reaction226`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of RAF-P from scaffold

Reaction equation

$$S\_2\_m1\_1 \longrightarrow K\_3\_1 + S\_2\_m1\_m1 \tag{451}$$
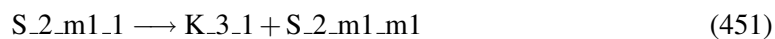
Reactant

Table 684: Properties of each reactant.

Id	Name	SBO
S_2_m1_1	Scaffold_MAPK-PP_RAF-P	

Products

Table 685: Properties of each product.

Id	Name	SBO
K_3_1	RAF-P	
S_2_m1_m1	Scaffold_MAPK-PP	

Kinetic Law

Derived unit contains undeclared units

$$v_{226} = \text{kpoff} \cdot S\_2\_m1\_1 \tag{452}$$

Table 686: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpoff			0.05		☑

5.227 Reaction `Reaction227`

This is an irreversible reaction of two reactants forming one product.

Name binding of RAF on scaffold

Reaction equation

$$K\_3\_0 + S\_2\_0\_m1 \longrightarrow S\_2\_0\_0 \tag{453}$$
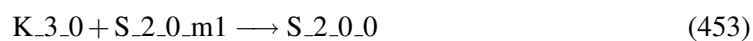
Reactants

Table 687: Properties of each reactant.

Id	Name	SBO
K_3_0	RAF	
S_2_0_m1	Scaffold_MAPK-PP_MEK	

Product

Table 688: Properties of each product.

Id	Name	SBO
S_2_0_0	Scaffold_MAPK-PP_MEK_RAF	

Kinetic Law

Derived unit contains undeclared units

$$v_{227} = \text{kon} \cdot \text{K\_3\_0} \cdot \text{S\_2\_0\_m1} \tag{454}$$

Table 689: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kon			10.0		☑

5.228 Reaction `Reaction228`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of RAF from scaffold

Reaction equation

$$S\_2\_0\_0 \longrightarrow K\_3\_0 + S\_2\_0\_m1 \tag{455}$$

Reactant

Table 690: Properties of each reactant.

Id	Name	SBO
S_2_0_0	Scaffold_MAPK-PP_MEK_RAF	

Products

Table 691: Properties of each product.

Id	Name	SBO
K_3_0	RAF	
S_2_0_m1	Scaffold_MAPK-PP_MEK	

Kinetic Law

Derived unit contains undeclared units

$$v_{228} = \text{koff} \cdot \text{S\_2\_0\_0} \tag{456}$$
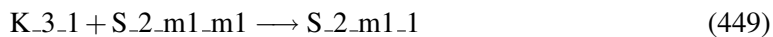
Table 692: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
koff			0.5		☑

5.229 Reaction `Reaction229`

This is an irreversible reaction of two reactants forming one product.

Name binding of RAF-P on scaffold

Reaction equation

$$\text{K\_3\_1} + \text{S\_2\_0\_m1} \longrightarrow \text{S\_2\_0\_1} \tag{457}$$

Reactants

Table 693: Properties of each reactant.

Id	Name	SBO
K_3_1	RAF-P	
S_2_0_m1	Scaffold_MAPK-PP_MEK	

Product

Table 694: Properties of each product.

Id	Name	SBO
S_2_0_1	Scaffold_MAPK-PP_MEK_RAF-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{229} = \text{kpon} \cdot \text{K\_3\_1} \cdot \text{S\_2\_0\_m1} \tag{458}$$

Table 695: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpon			0.0		☑

5.230 Reaction `Reaction230`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of RAF-P from scaffold

Reaction equation

$$\text{S\_2\_0\_1} \longrightarrow \text{K\_3\_1} + \text{S\_2\_0\_m1} \tag{459}$$

Reactant

Table 696: Properties of each reactant.

Id	Name	SBO
S_2_0_1	Scaffold_MAPK-PP_MEK_RAF-P	

Products

Table 697: Properties of each product.

Id	Name	SBO
K_3_1	RAF-P	
S_2_0_m1	Scaffold_MAPK-PP_MEK	

Kinetic Law

Derived unit contains undeclared units

$$v_{230} = \text{kpoff} \cdot \text{S\_2\_0\_1} \tag{460}$$
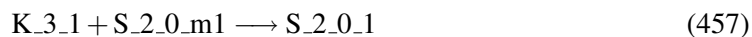
Table 698: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpoff			0.05		☑

5.231 Reaction `Reaction231`

This is an irreversible reaction of two reactants forming one product.

Name binding of RAF on scaffold

Reaction equation

$$\text{K\_3\_0} + \text{S\_2\_1\_m1} \longrightarrow \text{S\_2\_1\_0} \tag{461}$$
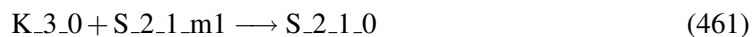
Reactants

Table 699: Properties of each reactant.

Id	Name	SBO
K_3_0	RAF	
S_2_1_m1	Scaffold_MAPK-PP_MEK-P	

Product

Table 700: Properties of each product.

Id	Name	SBO
S_2_1_0	Scaffold_MAPK-PP_MEK-P_RAF	

Kinetic Law

Derived unit contains undeclared units

$$v_{231} = \text{kon} \cdot \text{K\_3\_0} \cdot \text{S\_2\_1\_m1} \tag{462}$$

Table 701: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kon			10.0		☑

5.232 Reaction `Reaction232`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of RAF from scaffold

Reaction equation

$$S\_2\_1\_0 \longrightarrow K\_3\_0 + S\_2\_1\_m1 \tag{463}$$

Reactant

Table 702: Properties of each reactant.

Id	Name	SBO
S_2_1_0	Scaffold_MAPK-PP_MEK-P_RAF	

Products

Table 703: Properties of each product.

Id	Name	SBO
K_3_0	RAF	
S_2_1_m1	Scaffold_MAPK-PP_MEK-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{232} = \text{koff} \cdot S\_2\_1\_0 \tag{464}$$

Table 704: Properties of each parameter.

| Id	Name	SBO	Value	Unit	Constant
koff			0.5		☑

5.233 Reaction `Reaction233`

This is an irreversible reaction of two reactants forming one product.

Name binding of RAF-P on scaffold

Reaction equation

$$\text{K\_3\_1} + \text{S\_2\_1\_m1} \longrightarrow \text{S\_2\_1\_1} \tag{465}$$
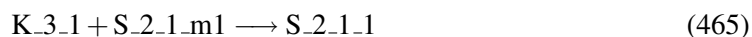
Reactants

Table 705: Properties of each reactant.

Id	Name	SBO
K_3_1	RAF-P	
S_2_1_m1	Scaffold_MAPK-PP_MEK-P	

Product

Table 706: Properties of each product.

Id	Name	SBO
S_2_1_1	Scaffold_MAPK-PP_MEK-P_RAF-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{233} = \text{kpon} \cdot \text{K\_3\_1} \cdot \text{S\_2\_1\_m1} \tag{466}$$
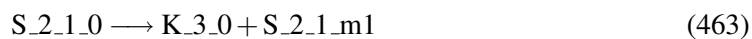
Table 707: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpon			0.0		☑

5.234 Reaction `Reaction234`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of RAF-P from scaffold

Reaction equation

$$S\_2\_1\_1 \longrightarrow K\_3\_1 + S\_2\_1\_m1 \tag{467}$$

Reactant

Table 708: Properties of each reactant.

Id	Name	SBO
S_2_1_1	Scaffold_MAPK-PP_MEK-P_RAF-P	

Products

Table 709: Properties of each product.

Id	Name	SBO
K_3_1	RAF-P	
S_2_1_m1	Scaffold_MAPK-PP_MEK-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{234} = \text{kpoff} \cdot \text{S\_2\_1\_1} \tag{468}$$

Table 710: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpoff			0.05		☑

5.235 Reaction `Reaction235`

This is an irreversible reaction of two reactants forming one product.

Name binding of RAF on scaffold

Reaction equation

$$K\_3\_0 + S\_2\_2\_m1 \longrightarrow S\_2\_2\_0 \tag{469}$$

Reactants

Table 711: Properties of each reactant.

Id	Name	SBO
K_3_0	RAF	
S_2_2_m1	Scaffold_MAPK-PP_MEK-PP	

Product

Table 712: Properties of each product.

Id	Name	SBO
S_2_2_0	Scaffold_MAPK-PP_MEK-PP_RAF	

Kinetic Law

Derived unit contains undeclared units

$$v_{235} = \text{kon} \cdot \text{K\_3\_0} \cdot \text{S\_2\_2\_m1} \tag{470}$$

Table 713: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kon			10.0		☑

5.236 Reaction `Reaction236`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of RAF from scaffold

Reaction equation

$$\text{S\_2\_2\_0} \longrightarrow \text{K\_3\_0} + \text{S\_2\_2\_m1} \tag{471}$$

Reactant

Table 714: Properties of each reactant.

Id	Name	SBO
S_2_2_0	Scaffold_MAPK-PP_MEK-PP_RAF	

Products

Table 715: Properties of each product.

Id	Name	SBO
K_3_0	RAF	
S_2_2_m1	Scaffold_MAPK-PP_MEK-PP	

Kinetic Law

Derived unit contains undeclared units

$$v_{236} = \text{koff} \cdot \text{S\_2\_2\_0} \tag{472}$$
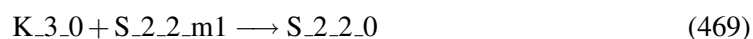
Table 716: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
koff			0.5		✓

5.237 Reaction `Reaction237`

This is an irreversible reaction of two reactants forming one product.

Name binding of RAF-P on scaffold

Reaction equation

$$\text{K\_3\_1} + \text{S\_2\_2\_m1} \longrightarrow \text{S\_2\_2\_1} \tag{473}$$
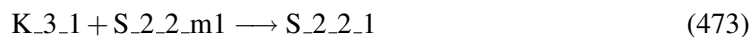
Reactants

Table 717: Properties of each reactant.

Id	Name	SBO
K_3_1	RAF-P	
S_2_2_m1	Scaffold_MAPK-PP_MEK-PP	

Product

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Table 718: Properties of each product.

Id	Name	SBO
S_2_2_1	Scaffold_MAPK-PP_MEK-PP_RAF-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{237} = \text{kpon} \cdot \text{K\_3\_1} \cdot \text{S\_2\_2\_m1} \tag{474}$$

Table 719: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpon			0.0		☑

5.238 Reaction `Reaction238`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of RAF-P from scaffold

Reaction equation

$$\text{S\_2\_2\_1} \longrightarrow \text{K\_3\_1} + \text{S\_2\_2\_m1} \tag{475}$$

Reactant

Table 720: Properties of each reactant.

Id	Name	SBO
S_2_2_1	Scaffold_MAPK-PP_MEK-PP_RAF-P	

Products

Table 721: Properties of each product.

Id	Name	SBO
K_3_1	RAF-P	
S_2_2_m1	Scaffold_MAPK-PP_MEK-PP	

Kinetic Law

Derived unit contains undeclared units

$$v_{238} = \text{kpoff} \cdot \text{S\_2\_2\_1} \tag{476}$$

Table 722: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kpoff			0.05		☑

5.239 Reaction `Reaction239`

This is an irreversible reaction of one reactant forming one product.

Name phosphorylation of MAPK on scaffold

Reaction equation

$$\text{S\_0\_2\_m1} \longrightarrow \text{S\_1\_2\_m1} \tag{477}$$

Reactant

Table 723: Properties of each reactant.

Id	Name	SBO
S_0_2_m1	Scaffold_MAPK_MEK-PP	

Product

Table 724: Properties of each product.

Id	Name	SBO
S_1_2_m1	Scaffold_MAPK-P_MEK-PP	

Kinetic Law

Derived unit contains undeclared units

$$v_{239} = \text{k7} \cdot \text{S\_0\_2\_m1} \tag{478}$$

Table 725: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k7			0.1		☑

5.240 Reaction Reaction240

This is an irreversible reaction of one reactant forming one product.

Name phosphorylation of MAPK on scaffold

Reaction equation

$$S\_0\_2\_0 \longrightarrow S\_1\_2\_0 \tag{479}$$

Reactant

Table 726: Properties of each reactant.

Id	Name	SBO
S_0_2_0	Scaffold_MAPK_MEK-PP_RAF	

Product

Table 727: Properties of each product.

Id	Name	SBO
S_1_2_0	Scaffold_MAPK-P_MEK-PP_RAF	

Kinetic Law

Derived unit contains undeclared units

$$v_{240} = k7 \cdot S\_0\_2\_0 \tag{480}$$
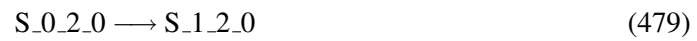
Table 728: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k7			0.1		☑

5.241 Reaction `Reaction241`

This is an irreversible reaction of one reactant forming one product.

Name phosphorylation of MAPK on scaffold

Reaction equation

$$S\_0\_2\_1 \longrightarrow S\_1\_2\_1 \tag{481}$$

Reactant

Table 729: Properties of each reactant.

Id	Name	SBO
S_0_2_1	Scaffold_MAPK_MEK-PP_RAF-P	

Product

Table 730: Properties of each product.

Id	Name	SBO
S_1_2_1	Scaffold_MAPK-P_MEK-PP_RAF-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{241} = k7 \cdot S\_0\_2\_1 \tag{482}$$

Table 731: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k7			0.1		☑

5.242 Reaction `Reaction242`

This is an irreversible reaction of one reactant forming one product.

Name phosphorylation of MAPK-P on scaffold

Reaction equation

$$S\_1\_2\_m1 \longrightarrow S\_2\_2\_m1 \tag{483}$$

Reactant

Table 732: Properties of each reactant.

Id	Name	SBO
S_1_2_m1	Scaffold_MAPK-P_MEK-PP	

Product

Table 733: Properties of each product.

Id	Name	SBO
S_2_2_m1	Scaffold_MAPK-PP_MEK-PP	

Kinetic Law

Derived unit contains undeclared units

$$v_{242} = \text{k9a} \cdot \text{S\_1\_2\_m1} \tag{484}$$

Table 734: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k9a			0.1		☑

5.243 Reaction `Reaction243`

This is an irreversible reaction of one reactant forming one product.

Name phosphorylation of MAPK-P on scaffold

Reaction equation

$$S\_1\_2\_0 \longrightarrow S\_2\_2\_0 \tag{485}$$

Reactant

Table 735: Properties of each reactant.

Id	Name	SBO
S_1_2_0	Scaffold_MAPK-P_MEK-PP_RAF	

Product

Table 736: Properties of each product.

Id	Name	SBO
S_2_2_0	Scaffold_MAPK-PP_MEK-PP_RAF	

Kinetic Law

Derived unit contains undeclared units

$$v_{243} = \text{k9a} \cdot \text{S\_1\_2\_0} \tag{486}$$

Table 737: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k9a			0.1		☑

5.244 Reaction `Reaction244`

This is an irreversible reaction of one reactant forming one product.

Name phosphorylation of MAPK-P on scaffold

Reaction equation

$$\text{S\_1\_2\_1} \longrightarrow \text{S\_2\_2\_1} \tag{487}$$

Reactant

Table 738: Properties of each reactant.

Id	Name	SBO
S_1_2_1	Scaffold_MAPK-P_MEK-PP_RAF-P	

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Product

Table 739: Properties of each product.

Id	Name	SBO
S_2_2_1	Scaffold_MAPK-PP_MEK-PP_RAF-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{244} = \text{k9a} \cdot \text{S\_1\_2\_1} \tag{488}$$

Table 740: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k9a			0.1		☑

5.245 Reaction `Reaction245`

This is an irreversible reaction of one reactant forming one product.

Name phosphorylation of MEK on scaffold

Reaction equation

$$\text{S\_m1\_0\_1} \longrightarrow \text{S\_m1\_1\_1} \tag{489}$$

Reactant

Table 741: Properties of each reactant.

Id	Name	SBO
S_m1_0_1	Scaffold_MEK_RAF-P	

Product

Table 742: Properties of each product.

Id	Name	SBO
S_m1_1_1	Scaffold_MEK-P_RAF-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{245} = \text{k3} \cdot \text{S\_m1\_0\_1} \tag{490}$$

Table 743: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k3			0.1		☑

5.246 Reaction `Reaction246`

This is an irreversible reaction of one reactant forming one product.

Name phosphorylation of MEK-P on scaffold

Reaction equation

$$\text{S\_m1\_1\_1} \longrightarrow \text{S\_m1\_2\_1} \tag{491}$$

Reactant

Table 744: Properties of each reactant.

Id	Name	SBO
S_m1_1_1	Scaffold_MEK-P_RAF-P	

Product

Table 745: Properties of each product.

Id	Name	SBO
S_m1_2_1	Scaffold_MEK-PP_RAF-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{246} = \text{k5a} \cdot \text{S\_m1\_1\_1} \tag{492}$$

Table 746: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k5a			0.1		☑

5.247 Reaction `Reaction247`

This is an irreversible reaction of one reactant forming one product.

Name phosphorylation of MEK on scaffold

Reaction equation

$$S\_0\_0\_1 \longrightarrow S\_0\_1\_1 \qquad (493)$$

Reactant

Table 747: Properties of each reactant.

Id	Name	SBO
S_0_0_1	Scaffold_MAPK_MEK_RAF-P	

Product

Table 748: Properties of each product.

Id	Name	SBO
S_0_1_1	Scaffold_MAPK_MEK-P_RAF-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{247} = \text{k3} \cdot \text{S\_0\_0\_1} \qquad (494)$$

Table 749: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k3			0.1		☑

5.248 Reaction `Reaction248`

This is an irreversible reaction of one reactant forming one product.

Name phosphorylation of MEK-P on scaffold

Reaction equation

$$S\_0\_1\_1 \longrightarrow S\_0\_2\_1 \tag{495}$$

Reactant

Table 750: Properties of each reactant.

Id	Name	SBO
S_0_1_1	Scaffold_MAPK_MEK-P_RAF-P	

Product

Table 751: Properties of each product.

Id	Name	SBO
S_0_2_1	Scaffold_MAPK_MEK-PP_RAF-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{248} = \text{k5a} \cdot S\_0\_1\_1 \tag{496}$$
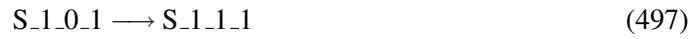
Table 752: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k5a			0.1		☑

5.249 Reaction `Reaction249`

This is an irreversible reaction of one reactant forming one product.

Name phosphorylation of MEK on scaffold

Reaction equation

$$S\_1\_0\_1 \longrightarrow S\_1\_1\_1 \tag{497}$$

Reactant

Table 753: Properties of each reactant.

Id	Name	SBO
S_1_0_1	Scaffold_MAPK-P_MEK_RAF-P	

Product

Table 754: Properties of each product.

Id	Name	SBO
S_1_1_1	Scaffold_MAPK-P_MEK-P_RAF-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{249} = \text{k3} \cdot \text{S\_1\_0\_1} \tag{498}$$

Table 755: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k3			0.1		☑

5.250 Reaction `Reaction250`

This is an irreversible reaction of one reactant forming one product.

Name phosphorylation of MEK-P on scaffold

Reaction equation

$$S\_1\_1\_1 \longrightarrow S\_1\_2\_1 \tag{499}$$

Reactant

Table 756: Properties of each reactant.

Id	Name	SBO
S_1_1_1	Scaffold_MAPK-P_MEK-P_RAF-P	

Product

Table 757: Properties of each product.

Id	Name	SBO
S_1_2_1	Scaffold_MAPK-P_MEK-PP_RAF-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{250} = k5a \cdot S\_1\_1\_1 \tag{500}$$

Table 758: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k5a			0.1		☑

5.251 Reaction `Reaction251`

This is an irreversible reaction of one reactant forming one product.

Name phosphorylation of MEK on scaffold

Reaction equation

$$S\_2\_0\_1 \longrightarrow S\_2\_1\_1 \tag{501}$$

Reactant

Table 759: Properties of each reactant.

Id	Name	SBO
S_2_0_1	Scaffold_MAPK-PP_MEK_RAF-P	

Product

Table 760: Properties of each product.

Id	Name	SBO
S_2_1_1	Scaffold_MAPK-PP_MEK-P_RAF-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{251} = \text{k3} \cdot \text{S\_2\_0\_1} \tag{502}$$

Table 761: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k3			0.1		☑

5.252 Reaction `Reaction252`

This is an irreversible reaction of one reactant forming one product.

Name phosphorylation of MEK-P on scaffold

Reaction equation

$$\text{S\_2\_1\_1} \longrightarrow \text{S\_2\_2\_1} \tag{503}$$

Reactant

Table 762: Properties of each reactant.

Id	Name	SBO
S_2_1_1	Scaffold_MAPK-PP_MEK-P_RAF-P	

Product

Table 763: Properties of each product.

Id	Name	SBO
S_2_2_1	Scaffold_MAPK-PP_MEK-PP_RAF-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{252} = \text{k5a} \cdot \text{S\_2\_1\_1} \tag{504}$$

Table 764: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k5a			0.1		☑

5.253 Reaction `Reaction253`

This is an irreversible reaction of two reactants forming one product.

Name binding of RAF and RAFK

Reaction equation

$$\text{RAFK} + \text{S\_m1\_m1\_0} \longrightarrow \text{S\_RAFK\_m1\_m1\_0} \tag{505}$$

Reactants

Table 765: Properties of each reactant.

Id	Name	SBO
RAFK	RAF kinase	
S_m1_m1_0	Scaffold_RAF	

Product

Table 766: Properties of each product.

Id	Name	SBO
S_RAFK_m1_m1_0	Scaffold_RAF	

Kinetic Law

Derived unit contains undeclared units

$$v_{253} = \text{k1a} \cdot \text{RAFK} \cdot \text{S\_m1\_m1\_0} \tag{506}$$

Table 767: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1a			100.0		☑

5.254 Reaction `Reaction254`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of RAF_RAFK

Reaction equation

$$S\_RAFK\_m1\_m1\_0 \longrightarrow RAFK + S\_m1\_m1\_0 \tag{507}$$
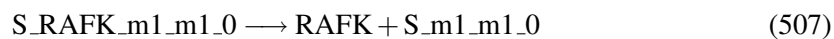
Reactant

Table 768: Properties of each reactant.

Id	Name	SBO
S_RAFK_m1_m1_0	Scaffold_RAF	

Products

Table 769: Properties of each product.

Id	Name	SBO
RAFK	RAF kinase	
S_m1_m1_0	Scaffold_RAF	

Kinetic Law

Derived unit contains undeclared units

$$v_{254} = d1a \cdot S\_RAFK\_m1\_m1\_0 \tag{508}$$

Table 770: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
d1a			0.0		☑

5.255 Reaction `Reaction255`

This is an irreversible reaction of one reactant forming two products.

Name phosphorylation of RAF on scaffold

Reaction equation

$$S\_RAFK\_m1\_m1\_0 \longrightarrow RAFK + S\_m1\_m1\_1 \tag{509}$$

Reactant

Table 771: Properties of each reactant.

Id	Name	SBO
S_RAFK_m1_m1_0	Scaffold_RAF	

Products

Table 772: Properties of each product.

Id	Name	SBO
RAFK	RAF kinase	
S_m1_m1_1	Scaffold_RAF-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{255} = k1 \cdot S\_RAFK\_m1\_m1\_0 \tag{510}$$

Table 773: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			0.1		☑

5.256 Reaction `Reaction256`

This is an irreversible reaction of two reactants forming one product.

Name binding of RAF and RAFK

Reaction equation

$$\text{RAFK} + \text{S\_m1\_0\_0} \longrightarrow \text{S\_RAFK\_m1\_0\_0} \tag{511}$$
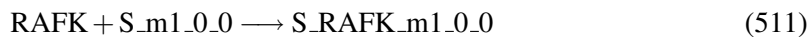
Reactants

Table 774: Properties of each reactant.

Id	Name	SBO
RAFK	RAF kinase	
S_m1_0_0	Scaffold_MEK_RAF	

Product

Table 775: Properties of each product.

Id	Name	SBO
S_RAFK_m1_0_0	Scaffold_MEK_RAF	

Kinetic Law

Derived unit contains undeclared units

$$v_{256} = \text{k1a} \cdot \text{RAFK} \cdot \text{S\_m1\_0\_0} \tag{512}$$

Table 776: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1a			100.0		☑

5.257 Reaction `Reaction257`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of RAF_RAFK

Reaction equation

$$\text{S\_RAFK\_m1\_0\_0} \longrightarrow \text{RAFK} + \text{S\_m1\_0\_0} \tag{513}$$

Reactant

Table 777: Properties of each reactant.

Id	Name	SBO
S_RAFK_m1_0_0	Scaffold_MEK_RAF	

Products

Table 778: Properties of each product.

Id	Name	SBO
RAFK	RAF kinase	
S_m1_0_0	Scaffold_MEK_RAF	

Kinetic Law

Derived unit contains undeclared units

$$v_{257} = \text{d1a} \cdot \text{S\_RAFK\_m1\_0\_0} \tag{514}$$

Table 779: Properties of each parameter.

| Id	Name	SBO	Value	Unit	Constant
d1a			0.0		☑

5.258 Reaction `Reaction258`

This is an irreversible reaction of one reactant forming two products.

Name phosphorylation of RAF on scaffold

Reaction equation

$$\text{S\_RAFK\_m1\_0\_0} \longrightarrow \text{RAFK} + \text{S\_m1\_0\_1} \tag{515}$$

Reactant

Table 780: Properties of each reactant.

Id	Name	SBO
S_RAFK_m1_0_0	Scaffold_MEK_RAF	

Products

Table 781: Properties of each product.

Id	Name	SBO
RAFK	RAF kinase	
S_m1_0_1	Scaffold_MEK_RAF-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{258} = \text{k1} \cdot \text{S\_RAFK\_m1\_0\_0} \tag{516}$$

Table 782: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			0.1		☑

5.259 Reaction `Reaction259`

This is an irreversible reaction of two reactants forming one product.

Name binding of RAF and RAFK

Reaction equation

$$\text{RAFK} + \text{S\_m1\_1\_0} \longrightarrow \text{S\_RAFK\_m1\_1\_0} \tag{517}$$
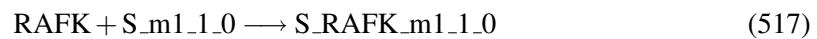
Reactants

Table 783: Properties of each reactant.

Id	Name	SBO
RAFK	RAF kinase	
S_m1_1_0	Scaffold_MEK-P_RAF	

Product

Table 784: Properties of each product.

Id	Name	SBO
S_RAFK_m1_1_0	Scaffold_MEK-P_RAF	

Kinetic Law

Derived unit contains undeclared units

$$v_{259} = \text{k1a} \cdot \text{RAFK} \cdot \text{S\_m1\_1\_0} \tag{518}$$

Table 785: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1a			100.0		☑

5.260 Reaction `Reaction260`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of RAF_RAFK

Reaction equation

$$\text{S\_RAFK\_m1\_1\_0} \longrightarrow \text{RAFK} + \text{S\_m1\_1\_0} \tag{519}$$
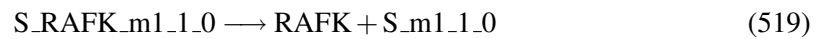
Reactant

Table 786: Properties of each reactant.

Id	Name	SBO
S_RAFK_m1_1_0	Scaffold_MEK-P_RAF	

Products

Table 787: Properties of each product.

Id	Name	SBO
RAFK	RAF kinase	
S_m1_1_0	Scaffold_MEK-P_RAF	

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Kinetic Law

Derived unit contains undeclared units

$$v_{260} = \text{d1a} \cdot \text{S\_RAFK\_m1\_1\_0} \tag{520}$$

Table 788: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
d1a			0.0		☑

5.261 Reaction `Reaction261`

This is an irreversible reaction of one reactant forming two products.

Name phosphorylation of RAF on scaffold

Reaction equation

$$\text{S\_RAFK\_m1\_1\_0} \longrightarrow \text{RAFK} + \text{S\_m1\_1\_1} \tag{521}$$
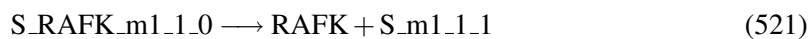
Reactant

Table 789: Properties of each reactant.

Id	Name	SBO
S_RAFK_m1_1_0	Scaffold_MEK-P_RAF	

Products

Table 790: Properties of each product.

Id	Name	SBO
RAFK	RAF kinase	
S_m1_1_1	Scaffold_MEK-P_RAF-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{261} = \text{k1} \cdot \text{S\_RAFK\_m1\_1\_0} \tag{522}$$
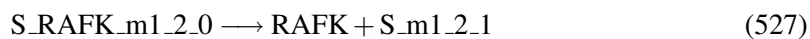
Table 791: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			0.1		☑

5.262 Reaction `Reaction262`

This is an irreversible reaction of two reactants forming one product.

Name binding of RAF and RAFK

Reaction equation

$$\text{RAFK} + \text{S\_m1\_2\_0} \longrightarrow \text{S\_RAFK\_m1\_2\_0} \tag{523}$$
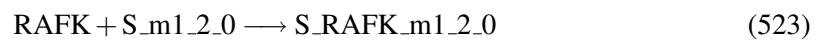
Reactants

Table 792: Properties of each reactant.

Id	Name	SBO
RAFK	RAF kinase	
S_m1_2_0	Scaffold_MEK-PP_RAF	

Product

Table 793: Properties of each product.

Id	Name	SBO
S_RAFK_m1_2_0	Scaffold_MEK-PP_RAF	

Kinetic Law

Derived unit contains undeclared units

$$v_{262} = \text{k1a} \cdot \text{RAFK} \cdot \text{S\_m1\_2\_0} \tag{524}$$

Table 794: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1a			100.0		☑

5.263 Reaction `Reaction263`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of RAF_RAFK

Reaction equation

$$S\_RAFK\_m1\_2\_0 \longrightarrow RAFK + S\_m1\_2\_0 \tag{525}$$

Reactant

Table 795: Properties of each reactant.

Id	Name	SBO
S_RAFK_m1_2_0	Scaffold_MEK-PP_RAF	

Products

Table 796: Properties of each product.

Id	Name	SBO
RAFK	RAF kinase	
S_m1_2_0	Scaffold_MEK-PP_RAF	

Kinetic Law

Derived unit contains undeclared units

$$v_{263} = d1a \cdot S\_RAFK\_m1\_2\_0 \tag{526}$$

Table 797: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
d1a			0.0		☑

5.264 Reaction `Reaction264`

This is an irreversible reaction of one reactant forming two products.

Name phosphorylation of RAF on scaffold

Reaction equation

$$S\_RAFK\_m1\_2\_0 \longrightarrow RAFK + S\_m1\_2\_1 \tag{527}$$

Reactant

Table 798: Properties of each reactant.

Id	Name	SBO
S_RAFK_m1_2_0	Scaffold_MEK-PP_RAF	

Products

Table 799: Properties of each product.

Id	Name	SBO
RAFK	RAF kinase	
S_m1_2_1	Scaffold_MEK-PP_RAF-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{264} = k1 \cdot S\_RAFK\_m1\_2\_0 \tag{528}$$
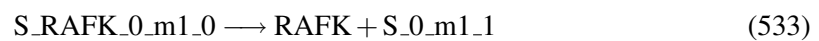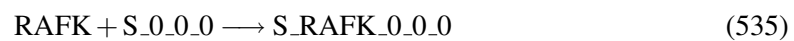
Table 800: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			0.1		☑

5.265 Reaction `Reaction265`

This is an irreversible reaction of two reactants forming one product.

Name binding of RAF and RAFK

Reaction equation

$$RAFK + S\_0\_m1\_0 \longrightarrow S\_RAFK\_0\_m1\_0 \tag{529}$$
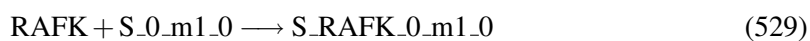
Reactants

Table 801: Properties of each reactant.

Id	Name	SBO
RAFK	RAF kinase	
S_0_m1_0	Scaffold_MAPK_RAF	

Product

Table 802: Properties of each product.

Id	Name	SBO
S_RAFK_0_m1_0	Scaffold_MAPK_RAF	

Kinetic Law

Derived unit contains undeclared units

$$v_{265} = \text{k1a} \cdot \text{RAFK} \cdot \text{S\_0\_m1\_0} \tag{530}$$

Table 803: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1a			100.0		☑

5.266 Reaction `Reaction266`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of RAF_RAFK

Reaction equation

$$\text{S\_RAFK\_0\_m1\_0} \longrightarrow \text{RAFK} + \text{S\_0\_m1\_0} \tag{531}$$
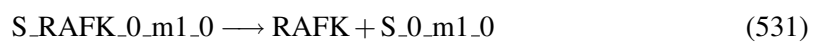
Reactant

Table 804: Properties of each reactant.

Id	Name	SBO
S_RAFK_0_m1_0	Scaffold_MAPK_RAF	

Products

Table 805: Properties of each product.

Id	Name	SBO
RAFK	RAF kinase	
S_0_m1_0	Scaffold_MAPK_RAF	

Kinetic Law

Derived unit contains undeclared units

$$v_{266} = \text{d1a} \cdot \text{S\_RAFK\_0\_m1\_0} \tag{532}$$

Table 806: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
d1a			0.0		☑

5.267 Reaction `Reaction267`

This is an irreversible reaction of one reactant forming two products.

Name phosphorylation of RAF on scaffold

Reaction equation

$$\text{S\_RAFK\_0\_m1\_0} \longrightarrow \text{RAFK} + \text{S\_0\_m1\_1} \tag{533}$$

Reactant

Table 807: Properties of each reactant.

Id	Name	SBO
S_RAFK_0_m1_0	Scaffold_MAPK_RAF	

Products

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Table 808: Properties of each product.

Id	Name	SBO
RAFK	RAF kinase	
S_0_m1_1	Scaffold_MAPK_RAF-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{267} = \text{k1} \cdot \text{S\_RAFK\_0\_m1\_0} \tag{534}$$
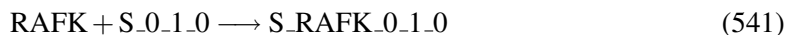
Table 809: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			0.1		☑

5.268 Reaction `Reaction268`

This is an irreversible reaction of two reactants forming one product.

Name binding of RAF and RAFK

Reaction equation

$$\text{RAFK} + \text{S\_0\_0\_0} \longrightarrow \text{S\_RAFK\_0\_0\_0} \tag{535}$$

Reactants

Table 810: Properties of each reactant.

Id	Name	SBO
RAFK	RAF kinase	
S_0_0_0	Scaffold_MAPK_MEK_RAF	

Product

Table 811: Properties of each product.

Id	Name	SBO
S_RAFK_0_0_0	Scaffold_MAPK_MEK_RAF	

Kinetic Law

Derived unit contains undeclared units

$$v_{268} = \text{k1a} \cdot \text{RAFK} \cdot \text{S\_0\_0\_0} \tag{536}$$

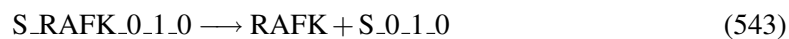Table 812: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1a			100.0		☑

5.269 Reaction `Reaction269`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of RAF_RAFK

Reaction equation

$$\text{S\_RAFK\_0\_0\_0} \longrightarrow \text{RAFK} + \text{S\_0\_0\_0} \tag{537}$$
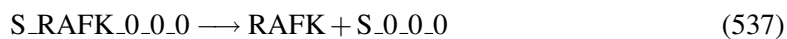
Reactant

Table 813: Properties of each reactant.

Id	Name	SBO
S_RAFK_0_0_0	Scaffold_MAPK_MEK_RAF	

Products

Table 814: Properties of each product.

Id	Name	SBO
RAFK	RAF kinase	
S_0_0_0	Scaffold_MAPK_MEK_RAF	

Kinetic Law

Derived unit contains undeclared units

$$v_{269} = \text{d1a} \cdot \text{S\_RAFK\_0\_0\_0} \tag{538}$$

Table 815: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
d1a			0.0		☑

5.270 Reaction `Reaction270`

This is an irreversible reaction of one reactant forming two products.

Name phosphorylation of RAF on scaffold

Reaction equation

$$S\_RAFK\_0\_0\_0 \longrightarrow RAFK + S\_0\_0\_1 \tag{539}$$
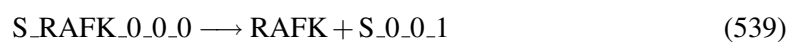
Reactant

Table 816: Properties of each reactant.

Id	Name	SBO
S_RAFK_0_0_0	Scaffold_MAPK_MEK_RAF	

Products

Table 817: Properties of each product.

Id	Name	SBO
RAFK	RAF kinase	
S_0_0_1	Scaffold_MAPK_MEK_RAF-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{270} = k1 \cdot S\_RAFK\_0\_0\_0 \tag{540}$$

Table 818: Properties of each parameter.

| Id	Name	SBO	Value	Unit	Constant
k1			0.1		☑

5.271 Reaction `Reaction271`

This is an irreversible reaction of two reactants forming one product.

Name binding of RAF and RAFK

Reaction equation

$$RAFK + S\_0\_1\_0 \longrightarrow S\_RAFK\_0\_1\_0 \tag{541}$$

Reactants

Table 819: Properties of each reactant.

Id	Name	SBO
RAFK	RAF kinase	
S_0_1_0	Scaffold_MAPK_MEK-P_RAF	

Product

Table 820: Properties of each product.

Id	Name	SBO
S_RAFK_0_1_0	Scaffold_MAPK_MEK-P_RAF	

Kinetic Law

Derived unit contains undeclared units

$$v_{271} = \text{k1a} \cdot RAFK \cdot S\_0\_1\_0 \tag{542}$$
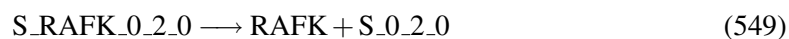
Table 821: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1a			100.0		✓

5.272 Reaction `Reaction272`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of RAF_RAFK

Reaction equation

$$S\_RAFK\_0\_1\_0 \longrightarrow RAFK + S\_0\_1\_0 \tag{543}$$

Reactant

Table 822: Properties of each reactant.

Id	Name	SBO
S_RAFK_0_1_0	Scaffold_MAPK_MEK-P_RAF	

Products

Table 823: Properties of each product.

Id	Name	SBO
RAFK	RAF kinase	
S_0_1_0	Scaffold_MAPK_MEK-P_RAF	

Kinetic Law

Derived unit contains undeclared units

$$v_{272} = d1a \cdot S\_RAFK\_0\_1\_0 \tag{544}$$

Table 824: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
d1a			0.0		☑

5.273 Reaction `Reaction273`

This is an irreversible reaction of one reactant forming two products.

Name phosphorylation of RAF on scaffold

Reaction equation

$$S\_RAFK\_0\_1\_0 \longrightarrow RAFK + S\_0\_1\_1 \tag{545}$$
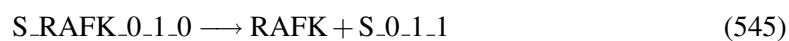
Reactant

Table 825: Properties of each reactant.

Id	Name	SBO
S_RAFK_0_1_0	Scaffold_MAPK_MEK-P_RAF	

Products

Table 826: Properties of each product.

Id	Name	SBO
RAFK	RAF kinase	
S_0_1_1	Scaffold_MAPK_MEK-P_RAF-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{273} = k1 \cdot S\_RAFK\_0\_1\_0 \tag{546}$$
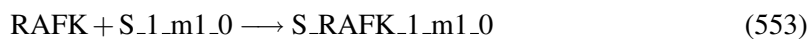
Table 827: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			0.1		☑

5.274 Reaction `Reaction274`

This is an irreversible reaction of two reactants forming one product.

Name binding of RAF and RAFK

Reaction equation

$$RAFK + S\_0\_2\_0 \longrightarrow S\_RAFK\_0\_2\_0 \tag{547}$$
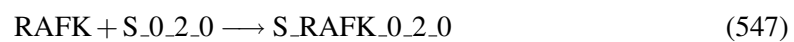
Reactants

Table 828: Properties of each reactant.

Id	Name	SBO
RAFK	RAF kinase	
S_0_2_0	Scaffold_MAPK_MEK-PP_RAF	

Product

Table 829: Properties of each product.

Id	Name	SBO
S_RAFK_0_2_0	Scaffold_MAPK_MEK-PP_RAF	

Kinetic Law

Derived unit contains undeclared units

$$v_{274} = \text{k1a} \cdot \text{RAFK} \cdot \text{S\_0\_2\_0} \tag{548}$$

Table 830: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1a			100.0		☑

5.275 Reaction `Reaction275`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of RAF_RAFK

Reaction equation

$$\text{S\_RAFK\_0\_2\_0} \longrightarrow \text{RAFK} + \text{S\_0\_2\_0} \tag{549}$$

Reactant

Table 831: Properties of each reactant.

Id	Name	SBO
S_RAFK_0_2_0	Scaffold_MAPK_MEK-PP_RAF	

Products

Table 832: Properties of each product.

Id	Name	SBO
RAFK	RAF kinase	

Id	Name	SBO
S_0_2_0	Scaffold_MAPK_MEK-PP_RAF	

Kinetic Law

Derived unit contains undeclared units

$$v_{275} = \text{d1a} \cdot \text{S\_RAFK\_0\_2\_0} \tag{550}$$

Table 833: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
d1a			0.0		☑

5.276 Reaction `Reaction276`

This is an irreversible reaction of one reactant forming two products.

Name phosphorylation of RAF on scaffold

Reaction equation

$$\text{S\_RAFK\_0\_2\_0} \longrightarrow \text{RAFK} + \text{S\_0\_2\_1} \tag{551}$$
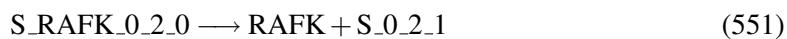
Reactant

Table 834: Properties of each reactant.

Id	Name	SBO
S_RAFK_0_2_0	Scaffold_MAPK_MEK-PP_RAF	

Products

Table 835: Properties of each product.

Id	Name	SBO
RAFK	RAF kinase	
S_0_2_1	Scaffold_MAPK_MEK-PP_RAF-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{276} = \text{k1} \cdot \text{S\_RAFK\_0\_2\_0} \tag{552}$$
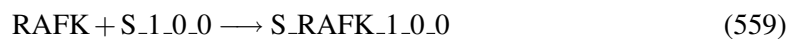
Table 836: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			0.1		☑

5.277 Reaction `Reaction277`

This is an irreversible reaction of two reactants forming one product.

Name binding of RAF and RAFK

Reaction equation

$$\text{RAFK} + \text{S\_1\_m1\_0} \longrightarrow \text{S\_RAFK\_1\_m1\_0} \tag{553}$$

Reactants

Table 837: Properties of each reactant.

Id	Name	SBO
RAFK	RAF kinase	
S_1_m1_0	Scaffold_MAPK-P_RAF	

Product

Table 838: Properties of each product.

Id	Name	SBO
S_RAFK_1_m1_0	Scaffold_MAPK-P_RAF	

Kinetic Law

Derived unit contains undeclared units

$$v_{277} = \text{k1a} \cdot \text{RAFK} \cdot \text{S\_1\_m1\_0} \tag{554}$$
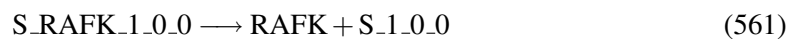
Table 839: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1a			100.0		☑

5.278 Reaction `Reaction278`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of RAF_RAFK

Reaction equation

$$S\_RAFK\_1\_m1\_0 \longrightarrow RAFK + S\_1\_m1\_0 \tag{555}$$
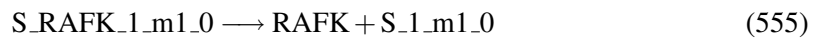
Reactant

Table 840: Properties of each reactant.

Id	Name	SBO
S_RAFK_1_m1_0	Scaffold_MAPK-P_RAF	

Products

Table 841: Properties of each product.

Id	Name	SBO
RAFK	RAF kinase	
S_1_m1_0	Scaffold_MAPK-P_RAF	

Kinetic Law

Derived unit contains undeclared units

$$v_{278} = \text{d1a} \cdot S\_RAFK\_1\_m1\_0 \tag{556}$$

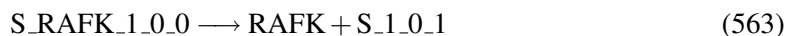Table 842: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
d1a			0.0		☑

5.279 Reaction `Reaction279`

This is an irreversible reaction of one reactant forming two products.

Name phosphorylation of RAF on scaffold

Reaction equation

$$S\_RAFK\_1\_m1\_0 \longrightarrow RAFK + S\_1\_m1\_1 \tag{557}$$
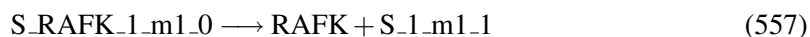
Reactant

Table 843: Properties of each reactant.

Id	Name	SBO
S_RAFK_1_m1_0	Scaffold_MAPK-P_RAF	

Products

Table 844: Properties of each product.

Id	Name	SBO
RAFK	RAF kinase	
S_1_m1_1	Scaffold_MAPK-P_RAF-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{279} = k1 \cdot S\_RAFK\_1\_m1\_0 \tag{558}$$
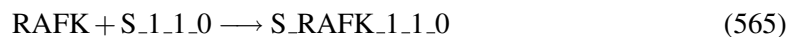
Table 845: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			0.1		☑

5.280 Reaction `Reaction280`

This is an irreversible reaction of two reactants forming one product.

Name binding of RAF and RAFK

Reaction equation

$$RAFK + S\_1\_0\_0 \longrightarrow S\_RAFK\_1\_0\_0 \tag{559}$$

Reactants

Table 846: Properties of each reactant.

Id	Name	SBO
RAFK	RAF kinase	
S_1_0_0	Scaffold_MAPK-P_MEK_RAF	

Product

Table 847: Properties of each product.

Id	Name	SBO
S_RAFK_1_0_0	Scaffold_MAPK-P_MEK_RAF	

Kinetic Law

Derived unit contains undeclared units

$$v_{280} = \text{k1a} \cdot RAFK \cdot S\_1\_0\_0 \tag{560}$$
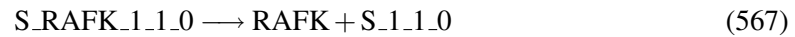
Table 848: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1a			100.0		☑

5.281 Reaction `Reaction281`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of RAF_RAFK

Reaction equation

$$S\_RAFK\_1\_0\_0 \longrightarrow RAFK + S\_1\_0\_0 \tag{561}$$

Reactant

Table 849: Properties of each reactant.

Id	Name	SBO
S_RAFK_1_0_0	Scaffold_MAPK-P_MEK_RAF	

Products

Table 850: Properties of each product.

Id	Name	SBO
RAFK	RAF kinase	
S_1_0_0	Scaffold_MAPK-P_MEK_RAF	

Kinetic Law

Derived unit contains undeclared units

$$v_{281} = \text{d1a} \cdot \text{S\_RAFK\_1\_0\_0} \tag{562}$$

Table 851: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
d1a			0.0		☑

5.282 Reaction Reaction282

This is an irreversible reaction of one reactant forming two products.

Name phosphorylation of RAF on scaffold

Reaction equation

$$\text{S\_RAFK\_1\_0\_0} \longrightarrow \text{RAFK} + \text{S\_1\_0\_1} \tag{563}$$

Reactant

Table 852: Properties of each reactant.

Id	Name	SBO
S_RAFK_1_0_0	Scaffold_MAPK-P_MEK_RAF	

Products

Table 853: Properties of each product.

Id	Name	SBO
RAFK	RAF kinase	
S_1_0_1	Scaffold_MAPK-P_MEK_RAF-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{282} = k1 \cdot S\_RAFK\_1\_0\_0 \tag{564}$$
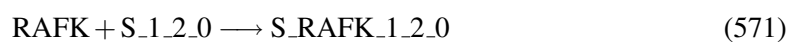
Table 854: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			0.1		☑

5.283 Reaction `Reaction283`

This is an irreversible reaction of two reactants forming one product.

Name binding of RAF and RAFK

Reaction equation

$$RAFK + S\_1\_1\_0 \longrightarrow S\_RAFK\_1\_1\_0 \tag{565}$$

Reactants

Table 855: Properties of each reactant.

Id	Name	SBO
RAFK	RAF kinase	
S_1_1_0	Scaffold_MAPK-P_MEK-P_RAF	

Product

Table 856: Properties of each product.

Id	Name	SBO
S_RAFK_1_1_0	Scaffold_MAPK-P_MEK-P_RAF	

Kinetic Law

Derived unit contains undeclared units

$$v_{283} = \text{k1a} \cdot \text{RAFK} \cdot \text{S\_1\_1\_0} \tag{566}$$

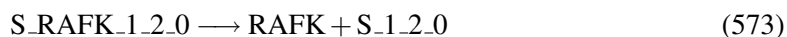Table 857: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1a			100.0		☑

5.284 Reaction `Reaction284`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of RAF_RAFK

Reaction equation

$$\text{S\_RAFK\_1\_1\_0} \longrightarrow \text{RAFK} + \text{S\_1\_1\_0} \tag{567}$$

Reactant

Table 858: Properties of each reactant.

Id	Name	SBO
S_RAFK_1_1_0	Scaffold_MAPK-P_MEK-P_RAF	

Products

Table 859: Properties of each product.

Id	Name	SBO
RAFK	RAF kinase	
S_1_1_0	Scaffold_MAPK-P_MEK-P_RAF	

Kinetic Law

Derived unit contains undeclared units

$$v_{284} = \text{d1a} \cdot \text{S\_RAFK\_1\_1\_0} \tag{568}$$
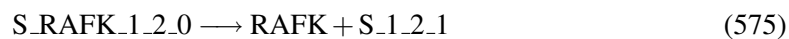
Table 860: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
d1a			0.0		☑

5.285 Reaction `Reaction285`

This is an irreversible reaction of one reactant forming two products.

Name phosphorylation of RAF on scaffold

Reaction equation

$$\text{S\_RAFK\_1\_1\_0} \longrightarrow \text{RAFK} + \text{S\_1\_1\_1} \tag{569}$$
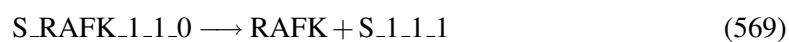
Reactant

Table 861: Properties of each reactant.

Id	Name	SBO
S_RAFK_1_1_0	Scaffold_MAPK-P_MEK-P_RAF	

Products

Table 862: Properties of each product.

Id	Name	SBO
RAFK	RAF kinase	
S_1_1_1	Scaffold_MAPK-P_MEK-P_RAF-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{285} = \text{k1} \cdot \text{S\_RAFK\_1\_1\_0} \tag{570}$$
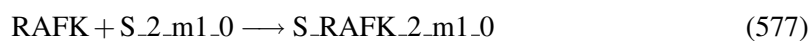
Table 863: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			0.1		☑

5.286 Reaction `Reaction286`

This is an irreversible reaction of two reactants forming one product.

Name binding of RAF and RAFK

Reaction equation

$$RAFK + S\_1\_2\_0 \longrightarrow S\_RAFK\_1\_2\_0 \tag{571}$$

Reactants

Table 864: Properties of each reactant.

Id	Name	SBO
RAFK	RAF kinase	
S_1_2_0	Scaffold_MAPK-P_MEK-PP_RAF	

Product

Table 865: Properties of each product.

Id	Name	SBO
S_RAFK_1_2_0	Scaffold_MAPK-P_MEK-PP_RAF	

Kinetic Law

Derived unit contains undeclared units

$$v_{286} = \text{k1a} \cdot \text{RAFK} \cdot \text{S}\_1\_2\_0 \tag{572}$$
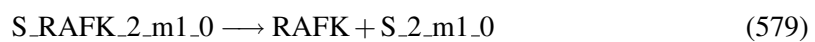
Table 866: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1a			100.0		☑

5.287 Reaction `Reaction287`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of RAF_RAFK

Reaction equation

$$S\_RAFK\_1\_2\_0 \longrightarrow RAFK + S\_1\_2\_0 \tag{573}$$

Reactant

Table 867: Properties of each reactant.

Id	Name	SBO
S_RAFK_1_2_0	Scaffold_MAPK-P_MEK-PP_RAF	

Products

Table 868: Properties of each product.

Id	Name	SBO
RAFK	RAF kinase	
S_1_2_0	Scaffold_MAPK-P_MEK-PP_RAF	

Kinetic Law

Derived unit contains undeclared units

$$v_{287} = \mathrm{d1a} \cdot S\_RAFK\_1\_2\_0 \tag{574}$$

Table 869: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
d1a			0.0		☑

5.288 Reaction `Reaction288`

This is an irreversible reaction of one reactant forming two products.

Name phosphorylation of RAF on scaffold

Reaction equation

$$S\_RAFK\_1\_2\_0 \longrightarrow RAFK + S\_1\_2\_1 \tag{575}$$

Reactant

Table 870: Properties of each reactant.

Id	Name	SBO
S_RAFK_1_2_0	Scaffold_MAPK-P_MEK-PP_RAF	

Products

Table 871: Properties of each product.

Id	Name	SBO
RAFK	RAF kinase	
S_1_2_1	Scaffold_MAPK-P_MEK-PP_RAF-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{288} = k1 \cdot S\_RAFK\_1\_2\_0 \tag{576}$$
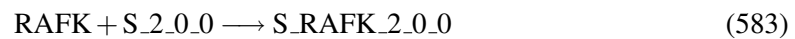
Table 872: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			0.1		☑

5.289 Reaction `Reaction289`

This is an irreversible reaction of two reactants forming one product.

Name binding of RAF and RAFK

Reaction equation

$$RAFK + S\_2\_m1\_0 \longrightarrow S\_RAFK\_2\_m1\_0 \tag{577}$$

Reactants

Table 873: Properties of each reactant.

Id	Name	SBO
RAFK	RAF kinase	
S_2_m1_0	Scaffold_MAPK-PP_RAF	

Product

Table 874: Properties of each product.

Id	Name	SBO
S_RAFK_2_m1_0	Scaffold_MAPK-PP_RAF	

Kinetic Law

Derived unit contains undeclared units

$$v_{289} = \text{k1a} \cdot \text{RAFK} \cdot \text{S\_2\_m1\_0} \tag{578}$$

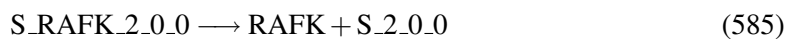Table 875: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1a			100.0		☑

5.290 Reaction `Reaction290`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of RAF_RAFK

Reaction equation

$$\text{S\_RAFK\_2\_m1\_0} \longrightarrow \text{RAFK} + \text{S\_2\_m1\_0} \tag{579}$$

Reactant

Table 876: Properties of each reactant.

Id	Name	SBO
S_RAFK_2_m1_0	Scaffold_MAPK-PP_RAF	

Products

Table 877: Properties of each product.

Id	Name	SBO
RAFK	RAF kinase	
S_2_m1_0	Scaffold_MAPK-PP_RAF	

Kinetic Law

Derived unit contains undeclared units

$$v_{290} = \text{d1a} \cdot \text{S\_RAFK\_2\_m1\_0} \tag{580}$$
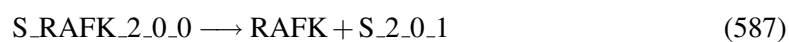
Table 878: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
d1a			0.0		☑

5.291 Reaction `Reaction291`

This is an irreversible reaction of one reactant forming two products.

Name phosphorylation of RAF on scaffold

Reaction equation

$$\text{S\_RAFK\_2\_m1\_0} \longrightarrow \text{RAFK} + \text{S\_2\_m1\_1} \tag{581}$$
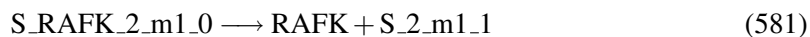
Reactant

Table 879: Properties of each reactant.

Id	Name	SBO
S_RAFK_2_m1_0	Scaffold_MAPK-PP_RAF	

Products

Table 880: Properties of each product.

Id	Name	SBO
RAFK	RAF kinase	
S_2_m1_1	Scaffold_MAPK-PP_RAF-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{291} = \text{k1} \cdot \text{S\_RAFK\_2\_m1\_0} \qquad (582)$$
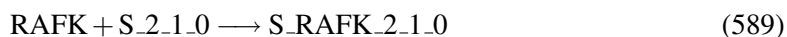
Table 881: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			0.1		☑

5.292 Reaction `Reaction292`

This is an irreversible reaction of two reactants forming one product.

Name binding of RAF and RAFK

Reaction equation

$$\text{RAFK} + \text{S\_2\_0\_0} \longrightarrow \text{S\_RAFK\_2\_0\_0} \qquad (583)$$

Reactants

Table 882: Properties of each reactant.

Id	Name	SBO
RAFK	RAF kinase	
S_2_0_0	Scaffold_MAPK-PP_MEK_RAF	

Product

Table 883: Properties of each product.

Id	Name	SBO
S_RAFK_2_0_0	Scaffold_MAPK-PP_MEK_RAF	

Kinetic Law

Derived unit contains undeclared units

$$v_{292} = \text{k1a} \cdot \text{RAFK} \cdot \text{S\_2\_0\_0} \tag{584}$$

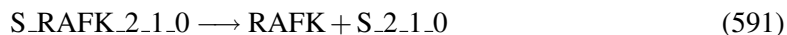Table 884: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1a			100.0		☑

5.293 Reaction `Reaction293`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of RAF_RAFK

Reaction equation

$$\text{S\_RAFK\_2\_0\_0} \longrightarrow \text{RAFK} + \text{S\_2\_0\_0} \tag{585}$$

Reactant

Table 885: Properties of each reactant.

Id	Name	SBO
S_RAFK_2_0_0	Scaffold_MAPK-PP_MEK_RAF	

Products

Table 886: Properties of each product.

Id	Name	SBO
RAFK	RAF kinase	
S_2_0_0	Scaffold_MAPK-PP_MEK_RAF	

Kinetic Law

Derived unit contains undeclared units

$$v_{293} = \text{d1a} \cdot \text{S\_RAFK\_2\_0\_0} \tag{586}$$
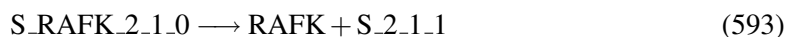
Table 887: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
d1a			0.0		☑

5.294 Reaction `Reaction294`

This is an irreversible reaction of one reactant forming two products.

Name phosphorylation of RAF on scaffold

Reaction equation

$$S\_RAFK\_2\_0\_0 \longrightarrow RAFK + S\_2\_0\_1 \tag{587}$$

Reactant

Table 888: Properties of each reactant.

Id	Name	SBO
S_RAFK_2_0_0	Scaffold_MAPK-PP_MEK_RAF	

Products

Table 889: Properties of each product.

Id	Name	SBO
RAFK	RAF kinase	
S_2_0_1	Scaffold_MAPK-PP_MEK_RAF-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{294} = k1 \cdot S\_RAFK\_2\_0\_0 \tag{588}$$

Table 890: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			0.1		☑

5.295 Reaction `Reaction295`

This is an irreversible reaction of two reactants forming one product.

Name binding of RAF and RAFK

Reaction equation

$$RAFK + S\_2\_1\_0 \longrightarrow S\_RAFK\_2\_1\_0 \tag{589}$$

Reactants

Table 891: Properties of each reactant.

Id	Name	SBO
RAFK	RAF kinase	
S_2_1_0	Scaffold_MAPK-PP_MEK-P_RAF	

Product

Table 892: Properties of each product.

Id	Name	SBO
S_RAFK_2_1_0	Scaffold_MAPK-PP_MEK-P_RAF	

Kinetic Law

Derived unit contains undeclared units

$$v_{295} = \text{k1a} \cdot RAFK \cdot S\_2\_1\_0 \tag{590}$$

Table 893: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1a			100.0		☑

5.296 Reaction `Reaction296`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of RAF_RAFK

Reaction equation

$$S\_RAFK\_2\_1\_0 \longrightarrow RAFK + S\_2\_1\_0 \tag{591}$$

Reactant

Table 894: Properties of each reactant.

Id	Name	SBO
S_RAFK_2_1_0	Scaffold_MAPK-PP_MEK-P_RAF	

Products

Table 895: Properties of each product.

Id	Name	SBO
RAFK	RAF kinase	
S_2_1_0	Scaffold_MAPK-PP_MEK-P_RAF	

Kinetic Law

Derived unit contains undeclared units

$$v_{296} = \text{d1a} \cdot S\_RAFK\_2\_1\_0 \tag{592}$$

Table 896: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
d1a			0.0		☑

5.297 Reaction `Reaction297`

This is an irreversible reaction of one reactant forming two products.

Name phosphorylation of RAF on scaffold

Reaction equation

$$S\_RAFK\_2\_1\_0 \longrightarrow RAFK + S\_2\_1\_1 \tag{593}$$

Reactant

Table 897: Properties of each reactant.

Id	Name	SBO
S_RAFK_2_1_0	Scaffold_MAPK-PP_MEK-P_RAF	

Products

Table 898: Properties of each product.

Id	Name	SBO
RAFK	RAF kinase	
S_2_1_1	Scaffold_MAPK-PP_MEK-P_RAF-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{297} = k1 \cdot S\_RAFK\_2\_1\_0 \qquad (594)$$

Table 899: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			0.1		☑

5.298 Reaction `Reaction298`

This is an irreversible reaction of two reactants forming one product.

Name binding of RAF and RAFK

Reaction equation

$$RAFK + S\_2\_2\_0 \longrightarrow S\_RAFK\_2\_2\_0 \qquad (595)$$
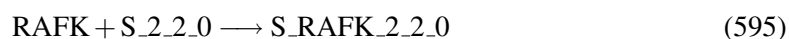
Reactants

Table 900: Properties of each reactant.

Id	Name	SBO
RAFK	RAF kinase	
S_2_2_0	Scaffold_MAPK-PP_MEK-PP_RAF	

Product

Table 901: Properties of each product.

Id	Name	SBO
S_RAFK_2_2_0	Scaffold_MAPK-PP_MEK-PP_RAF	

Kinetic Law

Derived unit contains undeclared units

$$v_{298} = \text{k1a} \cdot \text{RAFK} \cdot \text{S\_2\_2\_0} \tag{596}$$

Table 902: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1a			100.0		☑

5.299 Reaction `Reaction299`

This is an irreversible reaction of one reactant forming two products.

Name dissociation of RAF_RAFK

Reaction equation

$$\text{S\_RAFK\_2\_2\_0} \longrightarrow \text{RAFK} + \text{S\_2\_2\_0} \tag{597}$$
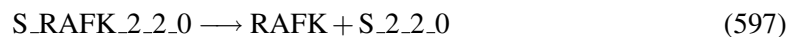
Reactant

Table 903: Properties of each reactant.

Id	Name	SBO
S_RAFK_2_2_0	Scaffold_MAPK-PP_MEK-PP_RAF	

Products

Table 904: Properties of each product.

Id	Name	SBO
RAFK	RAF kinase	

Id	Name	SBO
S_2_2_0	Scaffold_MAPK-PP_MEK-PP_RAF	

Kinetic Law

Derived unit contains undeclared units

$$v_{299} = \text{d1a} \cdot \text{S\_RAFK\_2\_2\_0} \tag{598}$$

Table 905: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
d1a			0.0		☑

5.300 Reaction `Reaction300`

This is an irreversible reaction of one reactant forming two products.

Name phosphorylation of RAF on scaffold

Reaction equation

$$\text{S\_RAFK\_2\_2\_0} \longrightarrow \text{RAFK} + \text{S\_2\_2\_1} \tag{599}$$
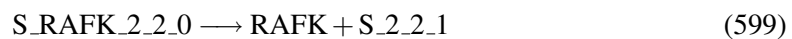
Reactant

Table 906: Properties of each reactant.

Id	Name	SBO
S_RAFK_2_2_0	Scaffold_MAPK-PP_MEK-PP_RAF	

Products

Table 907: Properties of each product.

Id	Name	SBO
RAFK	RAF kinase	
S_2_2_1	Scaffold_MAPK-PP_MEK-PP_RAF-P	

Kinetic Law

Derived unit contains undeclared units

$$v_{300} = k1 \cdot S\_RAFK\_2\_2\_0 \tag{600}$$

Table 908: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			0.1		☑

6 Derived Rate Equations

When interpreted as an ordinary differential equation framework, this model implies the following set of equations for the rates of change of each species.

Identifiers for kinetic laws highlighted in gray cannot be verified to evaluate to units of SBML `substance` per `time`. As a result, some SBML interpreters may not be able to verify the consistency of the units on quantities in the model. Please check if

- parameters without an unit definition are involved or

- volume correction is necessary because the `hasOnlySubstanceUnits` flag may be set to `false` and `spacialDimensions > 0` for certain species.

6.1 Species `MAPKP`

Name MAPK phosphatase

Initial amount 0.3 mol

This species takes part in six reactions (as a reactant in `Reaction22`, `Reaction28` and as a product in `Reaction23`, `Reaction24`, `Reaction29`, `Reaction30`).

$$\frac{d}{dt}\text{MAPKP} = v_{23} + v_{24} + v_{29} + v_{30} - v_{22} - v_{28} \tag{601}$$

6.2 Species `MEKP`

Name MEK phosphatase

Initial amount 0.2 mol

This species takes part in six reactions (as a reactant in `Reaction10`, `Reaction16` and as a product in `Reaction11`, `Reaction12`, `Reaction17`, `Reaction18`).

$$\frac{d}{dt}\text{MEKP} = v_{11} + v_{12} + v_{17} + v_{18} - v_{10} - v_{16} \tag{602}$$

Produced by SBML2LATEX

6.3 Species `RAFK`

Name RAF kinase

Initial amount 0.1 mol

This species takes part in 51 reactions (as a reactant in `Reaction1`, `Reaction253`, `Reaction256`, `Reaction259`, `Reaction262`, `Reaction265`, `Reaction268`, `Reaction271`, `Reaction274`, `Reaction277`, `Reaction280`, `Reaction283`, `Reaction286`, `Reaction289`, `Reaction292`, `Reaction295`, `Reaction298` and as a product in `Reaction2`, `Reaction3`, `Reaction254`, `Reaction255`, `Reaction257`, `Reaction258`, `Reaction260`, `Reaction261`, `Reaction263`, `Reaction264`, `Reaction266`, `Reaction267`, `Reaction269`, `Reaction270`, `Reaction272`, `Reaction273`, `Reaction275`, `Reaction276`, `Reaction278`, `Reaction279`, `Reaction281`, `Reaction282`, `Reaction284`, `Reaction285`, `Reaction287`, `Reaction288`, `Reaction290`, `Reaction291`, `Reaction293`, `Reaction294`, `Reaction296`, `Reaction297`, `Reaction299`, `Reaction300`).

$$
\begin{aligned}
\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{RAFK} = {} & v_2 + v_3 + v_{254} + v_{255} + v_{257} + v_{258} + v_{260} + v_{261} + v_{263} + v_{264} + v_{266} \\
& + v_{267} + v_{269} + v_{270} + v_{272} + v_{273} + v_{275} + v_{276} + v_{278} + v_{279} + v_{281} \\
& + v_{282} + v_{284} + v_{285} + v_{287} + v_{288} + v_{290} + v_{291} + v_{293} + v_{294} + v_{296} \\
& + v_{297} + v_{299} + v_{300} - v_1 - v_{253} - v_{256} - v_{259} - v_{262} - v_{265} - v_{268} \\
& - v_{271} - v_{274} - v_{277} - v_{280} - v_{283} - v_{286} - v_{289} - v_{292} - v_{295} - v_{298}
\end{aligned}
\tag{603}
$$

6.4 Species `RAFP`

Name RAF phosphatase

Initial amount 0.3 mol

This species takes part in three reactions (as a reactant in `Reaction4` and as a product in `Reaction5`, `Reaction6`).

$$
\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{RAFP} = v_5 + v_6 - v_4
\tag{604}
$$

6.5 Species `K_1_0`

Name MAPK

Initial amount 0.4 mol

This species takes part in 27 reactions (as a reactant in `Reaction19`, `Reaction31`, `Reaction33`, `Reaction35`, `Reaction37`, `Reaction39`, `Reaction41`, `Reaction43`, `Reaction45`, `Reaction47`, `Reaction49`, `Reaction51`, `Reaction53` and as a product in `Reaction20`, `Reaction24`, `Reaction32`,

Reaction34, Reaction36, Reaction38, Reaction40, Reaction42, Reaction44, Reaction46,
Reaction48, Reaction50, Reaction52, Reaction54).

$$
\begin{aligned}
\frac{d}{dt}\text{K\_1\_0} = {} & v_{20} + v_{24} + v_{32} + v_{34} + v_{36} + v_{38} + v_{40} + v_{42} + v_{44} \\
& + v_{46} + v_{48} + v_{50} + v_{52} + v_{54} - v_{19} - v_{31} - v_{33} - v_{35} \\
& - v_{37} - v_{39} - v_{41} - v_{43} - v_{45} - v_{47} - v_{49} - v_{51} - v_{53}
\end{aligned}
\tag{605}
$$

6.6 Species K_1_1

Name MAPK-P

Initial amount 0 mol

This species takes part in 30 reactions (as a reactant in Reaction22, Reaction25, Reaction55,
Reaction57, Reaction59, Reaction61, Reaction63, Reaction65, Reaction67, Reaction69,
Reaction71, Reaction73, Reaction75, Reaction77 and as a product in Reaction21, Reaction23,
Reaction26, Reaction30, Reaction56, Reaction58, Reaction60, Reaction62, Reaction64,
Reaction66, Reaction68, Reaction70, Reaction72, Reaction74, Reaction76, Reaction78).

$$
\begin{aligned}
\frac{d}{dt}\text{K\_1\_1} = {} & v_{21} + v_{23} + v_{26} + v_{30} + v_{56} + v_{58} + v_{60} + v_{62} + v_{64} + v_{66} \\
& + v_{68} + v_{70} + v_{72} + v_{74} + v_{76} + v_{78} - v_{22} - v_{25} - v_{55} - v_{57} \\
& - v_{59} - v_{61} - v_{63} - v_{65} - v_{67} - v_{69} - v_{71} - v_{73} - v_{75} - v_{77}
\end{aligned}
\tag{606}
$$

6.7 Species K_1_2

Name MAPK-PP

Initial amount 0 mol

This species takes part in 27 reactions (as a reactant in Reaction28, Reaction79, Reaction81,
Reaction83, Reaction85, Reaction87, Reaction89, Reaction91, Reaction93, Reaction95,
Reaction97, Reaction99, Reaction101 and as a product in Reaction27, Reaction29,
Reaction80, Reaction82, Reaction84, Reaction86, Reaction88, Reaction90, Reaction92,
Reaction94, Reaction96, Reaction98, Reaction100, Reaction102).

$$
\begin{aligned}
\frac{d}{dt}\text{K\_1\_2} = {} & v_{27} + v_{29} + v_{80} + v_{82} + v_{84} + v_{86} + v_{88} + v_{90} + v_{92} \\
& + v_{94} + v_{96} + v_{98} + v_{100} + v_{102} - v_{28} - v_{79} - v_{81} - v_{83} \\
& - v_{85} - v_{87} - v_{89} - v_{91} - v_{93} - v_{95} - v_{97} - v_{99} - v_{101}
\end{aligned}
\tag{607}
$$

Produced by SBML2LATEX

6.8 Species `K_2_0`

Name MEK

Initial amount 0.2 mol

This species takes part in 27 reactions (as a reactant in `Reaction7`, `Reaction103`, `Reaction105`, `Reaction107`, `Reaction121`, `Reaction123`, `Reaction125`, `Reaction139`, `Reaction141`, `Reaction143`, `Reaction157`, `Reaction159`, `Reaction161` and as a product in `Reaction8`, `Reaction12`, `Reaction104`, `Reaction106`, `Reaction108`, `Reaction122`, `Reaction124`, `Reaction126`, `Reaction140`, `Reaction142`, `Reaction144`, `Reaction158`, `Reaction160`, `Reaction162`).

$$
\begin{aligned}
\frac{d}{dt}\text{K\_2\_0} = {}& v_8 + v_{12} + v_{104} + v_{106} + v_{108} + v_{122} + v_{124} + v_{126} + v_{140} \\
& + v_{142} + v_{144} + v_{158} + v_{160} + v_{162} - v_7 - v_{103} - v_{105} - v_{107} \\
& - v_{121} - v_{123} - v_{125} - v_{139} - v_{141} - v_{143} - v_{157} - v_{159} - v_{161}
\end{aligned}
\tag{608}
$$

6.9 Species `K_2_1`

Name MEK-P

Initial amount 0 mol

This species takes part in 30 reactions (as a reactant in `Reaction10`, `Reaction13`, `Reaction109`, `Reaction111`, `Reaction113`, `Reaction127`, `Reaction129`, `Reaction131`, `Reaction145`, `Reaction147`, `Reaction149`, `Reaction163`, `Reaction165`, `Reaction167` and as a product in `Reaction9`, `Reaction11`, `Reaction14`, `Reaction18`, `Reaction110`, `Reaction112`, `Reaction114`, `Reaction128`, `Reaction130`, `Reaction132`, `Reaction146`, `Reaction148`, `Reaction150`, `Reaction164`, `Reaction166`, `Reaction168`).

$$
\begin{aligned}
\frac{d}{dt}\text{K\_2\_1} = {}& v_9 + v_{11} + v_{14} + v_{18} + v_{110} + v_{112} + v_{114} + v_{128} + v_{130} + v_{132} \\
& + v_{146} + v_{148} + v_{150} + v_{164} + v_{166} + v_{168} - v_{10} - v_{13} - v_{109} - v_{111} \\
& - v_{113} - v_{127} - v_{129} - v_{131} - v_{145} - v_{147} - v_{149} - v_{163} - v_{165} - v_{167}
\end{aligned}
\tag{609}
$$

6.10 Species `K_2_2`

Name MEK-PP

Initial amount 0 mol

This species takes part in 33 reactions (as a reactant in `Reaction16`, `Reaction19`, `Reaction25`, `Reaction115`, `Reaction117`, `Reaction119`, `Reaction133`, `Reaction135`, `Reaction137`, `Reaction151`, `Reaction153`, `Reaction155`, `Reaction169`, `Reaction171`, `Reaction173` and as a product in `Reaction15`, `Reaction17`, `Reaction20`, `Reaction21`, `Reaction26`,

Reaction27, Reaction116, Reaction118, Reaction120, Reaction134, Reaction136, Reaction138, Reaction152, Reaction154, Reaction156, Reaction170, Reaction172, Reaction174).

$$
\begin{aligned}
\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{K\_2\_2} = {} & v_{15} + v_{17} + v_{20} + v_{21} + v_{26} + v_{27} + v_{116} + v_{118} + v_{120} + v_{134} + v_{136} \\
& + v_{138} + v_{152} + v_{154} + v_{156} + v_{170} + v_{172} + v_{174} - v_{16} - v_{19} - v_{25} - v_{115} \\
& - v_{117} - v_{119} - v_{133} - v_{135} - v_{137} - v_{151} - v_{153} - v_{155} - v_{169} - v_{171} - v_{173}
\end{aligned}
\tag{610}
$$

6.11 Species K_3_0

Name RAF

Initial amount 0.3 mol

This species takes part in 35 reactions (as a reactant in Reaction1, Reaction175, Reaction179, Reaction183, Reaction187, Reaction191, Reaction195, Reaction199, Reaction203, Reaction207, Reaction211, Reaction215, Reaction219, Reaction223, Reaction227, Reaction231, Reaction235 and as a product in Reaction2, Reaction6, Reaction176, Reaction180, Reaction184, Reaction188, Reaction192, Reaction196, Reaction200, Reaction204, Reaction208, Reaction212, Reaction216, Reaction220, Reaction224, Reaction228, Reaction232, Reaction236).

$$
\begin{aligned}
\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{K\_3\_0} = {} & v_2 + v_6 + v_{176} + v_{180} + v_{184} + v_{188} + v_{192} + v_{196} + v_{200} \\
& + v_{204} + v_{208} + v_{212} + v_{216} + v_{220} + v_{224} + v_{228} + v_{232} + v_{236} \\
& - v_1 - v_{175} - v_{179} - v_{183} - v_{187} - v_{191} - v_{195} - v_{199} - v_{203} \\
& - v_{207} - v_{211} - v_{215} - v_{219} - v_{223} - v_{227} - v_{231} - v_{235}
\end{aligned}
\tag{611}
$$

6.12 Species K_3_1

Name RAF-P

Initial amount 0 mol

This species takes part in 41 reactions (as a reactant in Reaction4, Reaction7, Reaction13, Reaction177, Reaction181, Reaction185, Reaction189, Reaction193, Reaction197, Reaction201, Reaction205, Reaction209, Reaction213, Reaction217, Reaction221, Reaction225, Reaction229, Reaction233, Reaction237 and as a product in Reaction3, Reaction5, Reaction8, Reaction9, Reaction14, Reaction15, Reaction178, Reaction182, Reaction186, Reaction190, Reaction194, Reaction198, Reaction202, Reaction206, Reaction210, Reaction214, Reaction218, Reaction222, Reaction226, Reaction230, Reaction234, Reaction238).

Produced by SBML2LATEX

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{K\_3\_1} = v_3 + v_5 + v_8 + v_9 + v_{14} + v_{15} + v_{178} + v_{182} + v_{186} + v_{190} + v_{194}$$
$$+ v_{198} + v_{202} + v_{206} + v_{210} + v_{214} + v_{218} + v_{222} + v_{226} + v_{230} + v_{234}$$
$$+ v_{238} - v_4 - v_7 - v_{13} - v_{177} - v_{181} - v_{185} - v_{189} - v_{193} - v_{197}$$
$$- v_{201} - v_{205} - v_{209} - v_{213} - v_{217} - v_{221} - v_{225} - v_{229} - v_{233} - v_{237}$$
$$\tag{612}$$

6.13 Species K_K_1_0_2_2

Name MAPK_MEK-PP

Initial amount 0 mol

This species takes part in three reactions (as a reactant in `Reaction20`, `Reaction21` and as a product in `Reaction19`).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{K\_K\_1\_0\_2\_2} = v_{19} - v_{20} - v_{21} \tag{613}$$

6.14 Species K_K_1_1_2_2

Name MAPK-P_MEK-PP

Initial amount 0 mol

This species takes part in three reactions (as a reactant in `Reaction26`, `Reaction27` and as a product in `Reaction25`).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{K\_K\_1\_1\_2\_2} = v_{25} - v_{26} - v_{27} \tag{614}$$

6.15 Species K_K_2_0_3_1

Name MEK_RAF-P

Initial amount 0 mol

This species takes part in three reactions (as a reactant in `Reaction8`, `Reaction9` and as a product in `Reaction7`).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{K\_K\_2\_0\_3\_1} = v_7 - v_8 - v_9 \tag{615}$$

6.16 Species K_K_2_1_3_1

Name MEK-P_RAF-P

Initial amount 0 mol

This species takes part in three reactions (as a reactant in Reaction14, Reaction15 and as a product in Reaction13).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{K\_K\_2\_1\_3\_1} = v_{13} - v_{14} - v_{15} \tag{616}$$

6.17 Species K_MAPKP_1_1

Name MAPK-P_MAPKPase

Initial amount 0 mol

This species takes part in three reactions (as a reactant in Reaction23, Reaction24 and as a product in Reaction22).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{K\_MAPKP\_1\_1} = v_{22} - v_{23} - v_{24} \tag{617}$$

6.18 Species K_MAPKP_1_2

Name MAPK-PP_MAPKPase

Initial amount 0 mol

This species takes part in three reactions (as a reactant in Reaction29, Reaction30 and as a product in Reaction28).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{K\_MAPKP\_1\_2} = v_{28} - v_{29} - v_{30} \tag{618}$$

6.19 Species K_MEKP_2_1

Name MEK-P_MEKPase

Initial amount 0 mol

This species takes part in three reactions (as a reactant in Reaction11, Reaction12 and as a product in Reaction10).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{K\_MEKP\_2\_1} = v_{10} - v_{11} - v_{12} \tag{619}$$

6.20 Species K_MEKP_2_2

Name MEK-PP_MEKPase

Initial amount 0 mol

This species takes part in three reactions (as a reactant in Reaction17, Reaction18 and as a product in Reaction16).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{K\_MEKP\_2\_2} = v_{16} - v_{17} - v_{18} \tag{620}$$

6.21 Species K_RAFK_3_0

Name RAF_RAFK

Initial amount 0 mol

This species takes part in three reactions (as a reactant in Reaction2, Reaction3 and as a product in Reaction1).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{K\_RAFK\_3\_0} = v_1 - v_2 - v_3 \tag{621}$$

6.22 Species K_RAFP_3_1

Name RAF-P_RAFPase

Initial amount 0 mol

This species takes part in three reactions (as a reactant in Reaction5, Reaction6 and as a product in Reaction4).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{K\_RAFP\_3\_1} = v_4 - v_5 - v_6 \tag{622}$$

6.23 Species S_m1_m1_m1

Name Scaffold

Initial amount 0.1 mol

This species takes part in 16 reactions (as a reactant in Reaction31, Reaction55, Reaction79, Reaction103, Reaction109, Reaction115, Reaction175, Reaction177 and as a product in Reaction32, Reaction56, Reaction80, Reaction104, Reaction110, Reaction116, Reaction176, Reaction178).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{S\_m1\_m1\_m1} = v_{32} + v_{56} + v_{80} + v_{104} + v_{110} + v_{116} + v_{176} + v_{178} \tag{623}$$
$$- v_{31} - v_{55} - v_{79} - v_{103} - v_{109} - v_{115} - v_{175} - v_{177}$$

6.24 Species S_m1_m1_0

Name Scaffold_RAF

Initial amount 0 mol

This species takes part in 16 reactions (as a reactant in Reaction33, Reaction57, Reaction81, Reaction105, Reaction111, Reaction117, Reaction176, Reaction253 and as a product in Reaction34, Reaction58, Reaction82, Reaction106, Reaction112, Reaction118, Reaction175, Reaction254).

$$
\frac{d}{dt}\text{S\_m1\_m1\_0} = v_{34} + v_{58} + v_{82} + v_{106} + v_{112} + v_{118} + v_{175} + v_{254} \tag{624}
$$
$$
- v_{33} - v_{57} - v_{81} - v_{105} - v_{111} - v_{117} - v_{176} - v_{253}
$$

6.25 Species S_m1_m1_1

Name Scaffold_RAF-P

Initial amount 0 mol

This species takes part in 15 reactions (as a reactant in Reaction35, Reaction59, Reaction83, Reaction107, Reaction113, Reaction119, Reaction178 and as a product in Reaction36, Reaction60, Reaction84, Reaction108, Reaction114, Reaction120, Reaction177, Reaction255).

$$
\frac{d}{dt}\text{S\_m1\_m1\_1} = v_{36} + v_{60} + v_{84} + v_{108} + v_{114} + v_{120} + v_{177} + v_{255} \tag{625}
$$
$$
- v_{35} - v_{59} - v_{83} - v_{107} - v_{113} - v_{119} - v_{178}
$$

6.26 Species S_m1_0_m1

Name Scaffold_MEK

Initial amount 0 mol

This species takes part in twelve reactions (as a reactant in Reaction37, Reaction61, Reaction85, Reaction104, Reaction179, Reaction181 and as a product in Reaction38, Reaction62, Reaction86, Reaction103, Reaction180, Reaction182).

$$
\frac{d}{dt}\text{S\_m1\_0\_m1} = v_{38} + v_{62} + v_{86} + v_{103} + v_{180} + v_{182} \tag{626}
$$
$$
- v_{37} - v_{61} - v_{85} - v_{104} - v_{179} - v_{181}
$$

6.27 Species S_m1_0_0

Name Scaffold_MEK_RAF

Initial amount 0 mol

This species takes part in twelve reactions (as a reactant in Reaction39, Reaction63, Reaction87, Reaction106, Reaction180, Reaction256 and as a product in Reaction40, Reaction64, Reaction88, Reaction105, Reaction179, Reaction257).

$$
\frac{\mathrm{d}}{\mathrm{d}t} \text{S\_m1\_0\_0} = v_{40} + v_{64} + v_{88} + v_{105} + v_{179} + v_{257}
$$
$$
- v_{39} - v_{63} - v_{87} - v_{106} - v_{180} - v_{256}
\tag{627}
$$

6.28 Species S_m1_0_1

Name Scaffold_MEK_RAF-P

Initial amount 0 mol

This species takes part in twelve reactions (as a reactant in Reaction41, Reaction65, Reaction89, Reaction108, Reaction182, Reaction245 and as a product in Reaction42, Reaction66, Reaction90, Reaction107, Reaction181, Reaction258).

$$
\frac{\mathrm{d}}{\mathrm{d}t} \text{S\_m1\_0\_1} = v_{42} + v_{66} + v_{90} + v_{107} + v_{181} + v_{258}
$$
$$
- v_{41} - v_{65} - v_{89} - v_{108} - v_{182} - v_{245}
\tag{628}
$$

6.29 Species S_m1_1_m1

Name Scaffold_MEK-P

Initial amount 0 mol

This species takes part in twelve reactions (as a reactant in Reaction43, Reaction67, Reaction91, Reaction110, Reaction183, Reaction185 and as a product in Reaction44, Reaction68, Reaction92, Reaction109, Reaction184, Reaction186).

$$
\frac{\mathrm{d}}{\mathrm{d}t} \text{S\_m1\_1\_m1} = v_{44} + v_{68} + v_{92} + v_{109} + v_{184} + v_{186}
$$
$$
- v_{43} - v_{67} - v_{91} - v_{110} - v_{183} - v_{185}
\tag{629}
$$

6.30 Species S_m1_1_0

Name Scaffold_MEK-P_RAF

Initial amount 0 mol

This species takes part in twelve reactions (as a reactant in `Reaction45`, `Reaction69`, `Reaction93`, `Reaction112`, `Reaction184`, `Reaction259` and as a product in `Reaction46`, `Reaction70`, `Reaction94`, `Reaction111`, `Reaction183`, `Reaction260`).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{S\_m1\_1\_0} = v_{46} + v_{70} + v_{94} + v_{111} + v_{183} + v_{260} \tag{630}$$
$$- v_{45} - v_{69} - v_{93} - v_{112} - v_{184} - v_{259}$$

6.31 Species S_m1_1_1

Name Scaffold_MEK-P_RAF-P

Initial amount 0 mol

This species takes part in 13 reactions (as a reactant in `Reaction47`, `Reaction71`, `Reaction95`, `Reaction114`, `Reaction186`, `Reaction246` and as a product in `Reaction48`, `Reaction72`, `Reaction96`, `Reaction113`, `Reaction185`, `Reaction245`, `Reaction261`).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{S\_m1\_1\_1} = v_{48} + v_{72} + v_{96} + v_{113} + v_{185} + v_{245} + v_{261} \tag{631}$$
$$- v_{47} - v_{71} - v_{95} - v_{114} - v_{186} - v_{246}$$

6.32 Species S_m1_2_m1

Name Scaffold_MEK-PP

Initial amount 0 mol

This species takes part in twelve reactions (as a reactant in `Reaction49`, `Reaction73`, `Reaction97`, `Reaction116`, `Reaction187`, `Reaction189` and as a product in `Reaction50`, `Reaction74`, `Reaction98`, `Reaction115`, `Reaction188`, `Reaction190`).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{S\_m1\_2\_m1} = v_{50} + v_{74} + v_{98} + v_{115} + v_{188} + v_{190} \tag{632}$$
$$- v_{49} - v_{73} - v_{97} - v_{116} - v_{187} - v_{189}$$

6.33 Species S_m1_2_0

Name Scaffold_MEK-PP_RAF

Initial amount 0 mol

This species takes part in twelve reactions (as a reactant in Reaction51, Reaction75, Reaction99, Reaction118, Reaction188, Reaction262 and as a product in Reaction52, Reaction76, Reaction100, Reaction117, Reaction187, Reaction263).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{S\_m1\_2\_0} = v_{52} + v_{76} + v_{100} + v_{117} + v_{187} + v_{263} \tag{633}$$
$$- v_{51} - v_{75} - v_{99} - v_{118} - v_{188} - v_{262}$$

6.34 Species S_m1_2_1

Name Scaffold_MEK-PP_RAF-P

Initial amount 0 mol

This species takes part in twelve reactions (as a reactant in Reaction53, Reaction77, Reaction101, Reaction120, Reaction190 and as a product in Reaction54, Reaction78, Reaction102, Reaction119, Reaction189, Reaction246, Reaction264).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{S\_m1\_2\_1} = v_{54} + v_{78} + v_{102} + v_{119} + v_{189} + v_{246} \tag{634}$$
$$+ v_{264} - v_{53} - v_{77} - v_{101} - v_{120} - v_{190}$$

6.35 Species S_0_m1_m1

Name Scaffold_MAPK

Initial amount 0 mol

This species takes part in twelve reactions (as a reactant in Reaction32, Reaction121, Reaction127, Reaction133, Reaction191, Reaction193 and as a product in Reaction31, Reaction122, Reaction128, Reaction134, Reaction192, Reaction194).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{S\_0\_m1\_m1} = v_{31} + v_{122} + v_{128} + v_{134} + v_{192} + v_{194} \tag{635}$$
$$- v_{32} - v_{121} - v_{127} - v_{133} - v_{191} - v_{193}$$

6.36 Species S_0_m1_0

Name Scaffold_MAPK_RAF

Initial amount 0 mol

This species takes part in twelve reactions (as a reactant in Reaction34, Reaction123, Reaction129, Reaction135, Reaction192, Reaction265 and as a product in Reaction33, Reaction124, Reaction130, Reaction136, Reaction191, Reaction266).

$$
\frac{\mathrm{d}}{\mathrm{d}t}\text{S\_0\_m1\_0} = v_{33} + v_{124} + v_{130} + v_{136} + v_{191} + v_{266}
$$
$$
- v_{34} - v_{123} - v_{129} - v_{135} - v_{192} - v_{265}
$$

(636)

6.37 Species S_0_m1_1

Name Scaffold_MAPK_RAF-P

Initial amount 0 mol

This species takes part in eleven reactions (as a reactant in Reaction36, Reaction125, Reaction131, Reaction137, Reaction194 and as a product in Reaction35, Reaction126, Reaction132, Reaction138, Reaction193, Reaction267).

$$
\frac{\mathrm{d}}{\mathrm{d}t}\text{S\_0\_m1\_1} = v_{35} + v_{126} + v_{132} + v_{138} + v_{193} + v_{267}
$$
$$
- v_{36} - v_{125} - v_{131} - v_{137} - v_{194}
$$

(637)

6.38 Species S_0_0_m1

Name Scaffold_MAPK_MEK

Initial amount 0 mol

This species takes part in eight reactions (as a reactant in Reaction38, Reaction122, Reaction195, Reaction197 and as a product in Reaction37, Reaction121, Reaction196, Reaction198).

$$
\frac{\mathrm{d}}{\mathrm{d}t}\text{S\_0\_0\_m1} = v_{37} + v_{121} + v_{196} + v_{198} - v_{38} - v_{122} - v_{195} - v_{197}
$$

(638)

6.39 Species S_0_0_0

Name Scaffold_MAPK_MEK_RAF

Initial amount 0 mol

This species takes part in eight reactions (as a reactant in Reaction40, Reaction124, Reaction196, Reaction268 and as a product in Reaction39, Reaction123, Reaction195, Reaction269).

$$
\frac{\mathrm{d}}{\mathrm{d}t}\text{S\_0\_0\_0} = v_{39} + v_{123} + v_{195} + v_{269} - v_{40} - v_{124} - v_{196} - v_{268}
$$

(639)

6.40 Species S_0_0_1

Name Scaffold_MAPK_MEK_RAF-P

Initial amount 0 mol

This species takes part in eight reactions (as a reactant in `Reaction42`, `Reaction126`, `Reaction198`, `Reaction247` and as a product in `Reaction41`, `Reaction125`, `Reaction197`, `Reaction270`).

$$\frac{d}{dt}S\_0\_0\_1 = v_{41} + v_{125} + v_{197} + v_{270} - v_{42} - v_{126} - v_{198} - v_{247} \qquad (640)$$

6.41 Species S_0_1_m1

Name Scaffold_MAPK_MEK-P

Initial amount 0 mol

This species takes part in eight reactions (as a reactant in `Reaction44`, `Reaction128`, `Reaction199`, `Reaction201` and as a product in `Reaction43`, `Reaction127`, `Reaction200`, `Reaction202`).

$$\frac{d}{dt}S\_0\_1\_m1 = v_{43} + v_{127} + v_{200} + v_{202} - v_{44} - v_{128} - v_{199} - v_{201} \qquad (641)$$

6.42 Species S_0_1_0

Name Scaffold_MAPK_MEK-P_RAF

Initial amount 0 mol

This species takes part in eight reactions (as a reactant in `Reaction46`, `Reaction130`, `Reaction200`, `Reaction271` and as a product in `Reaction45`, `Reaction129`, `Reaction199`, `Reaction272`).

$$\frac{d}{dt}S\_0\_1\_0 = v_{45} + v_{129} + v_{199} + v_{272} - v_{46} - v_{130} - v_{200} - v_{271} \qquad (642)$$

6.43 Species S_0_1_1

Name Scaffold_MAPK_MEK-P_RAF-P

Initial amount 0 mol

This species takes part in nine reactions (as a reactant in `Reaction48`, `Reaction132`, `Reaction202`, `Reaction248` and as a product in `Reaction47`, `Reaction131`, `Reaction201`, `Reaction247`, `Reaction273`).

$$\frac{d}{dt}S\_0\_1\_1 = v_{47} + v_{131} + v_{201} + v_{247} + v_{273} - v_{48} - v_{132} - v_{202} - v_{248} \qquad (643)$$

6.44 Species S_0_2_m1

Name Scaffold_MAPK_MEK-PP

Initial amount 0 mol

This species takes part in nine reactions (as a reactant in Reaction50, Reaction134, Reaction203, Reaction205, Reaction239 and as a product in Reaction49, Reaction133, Reaction204, Reaction206).

$$\frac{d}{dt}S\_0\_2\_m1 = v_{49} + v_{133} + v_{204} + v_{206} - v_{50} - v_{134} - v_{203} - v_{205} - v_{239} \quad (644)$$

6.45 Species S_0_2_0

Name Scaffold_MAPK_MEK-PP_RAF

Initial amount 0 mol

This species takes part in nine reactions (as a reactant in Reaction52, Reaction136, Reaction204, Reaction240, Reaction274 and as a product in Reaction51, Reaction135, Reaction203, Reaction275).

$$\frac{d}{dt}S\_0\_2\_0 = v_{51} + v_{135} + v_{203} + v_{275} - v_{52} - v_{136} - v_{204} - v_{240} - v_{274} \quad (645)$$

6.46 Species S_0_2_1

Name Scaffold_MAPK_MEK-PP_RAF-P

Initial amount 0 mol

This species takes part in nine reactions (as a reactant in Reaction54, Reaction138, Reaction206, Reaction241 and as a product in Reaction53, Reaction137, Reaction205, Reaction248, Reaction276).

$$\frac{d}{dt}S\_0\_2\_1 = v_{53} + v_{137} + v_{205} + v_{248} + v_{276} - v_{54} - v_{138} - v_{206} - v_{241} \quad (646)$$

6.47 Species S_1_m1_m1

Name Scaffold_MAPK-P

Initial amount 0 mol

This species takes part in twelve reactions (as a reactant in Reaction56, Reaction139, Reaction145, Reaction151, Reaction207, Reaction209 and as a product in Reaction55, Reaction140, Reaction146, Reaction152, Reaction208, Reaction210).

$$\frac{d}{dt}S\_1\_m1\_m1 = v_{55} + v_{140} + v_{146} + v_{152} + v_{208} + v_{210}$$
$$- v_{56} - v_{139} - v_{145} - v_{151} - v_{207} - v_{209} \quad (647)$$

6.48 Species S_1_m1_0

Name Scaffold_MAPK-P_RAF

Initial amount 0 mol

This species takes part in twelve reactions (as a reactant in Reaction58, Reaction141, Reaction147, Reaction153, Reaction208, Reaction277 and as a product in Reaction57, Reaction142, Reaction148, Reaction154, Reaction207, Reaction278).

$$\frac{d}{dt}S\_1\_m1\_0 = v_{57} + v_{142} + v_{148} + v_{154} + v_{207} + v_{278} \\ - v_{58} - v_{141} - v_{147} - v_{153} - v_{208} - v_{277} \tag{648}$$

6.49 Species S_1_m1_1

Name Scaffold_MAPK-P_RAF-P

Initial amount 0 mol

This species takes part in eleven reactions (as a reactant in Reaction60, Reaction143, Reaction149, Reaction155, Reaction210 and as a product in Reaction59, Reaction144, Reaction150, Reaction156, Reaction209, Reaction279).

$$\frac{d}{dt}S\_1\_m1\_1 = v_{59} + v_{144} + v_{150} + v_{156} + v_{209} + v_{279} \\ - v_{60} - v_{143} - v_{149} - v_{155} - v_{210} \tag{649}$$

6.50 Species S_1_0_m1

Name Scaffold_MAPK-P_MEK

Initial amount 0 mol

This species takes part in eight reactions (as a reactant in Reaction62, Reaction140, Reaction211, Reaction213 and as a product in Reaction61, Reaction139, Reaction212, Reaction214).

$$\frac{d}{dt}S\_1\_0\_m1 = v_{61} + v_{139} + v_{212} + v_{214} - v_{62} - v_{140} - v_{211} - v_{213} \tag{650}$$

6.51 Species S_1_0_0

Name Scaffold_MAPK-P_MEK_RAF

Initial amount 0 mol

This species takes part in eight reactions (as a reactant in Reaction64, Reaction142, Reaction212, Reaction280 and as a product in Reaction63, Reaction141, Reaction211, Reaction281).

$$\frac{d}{dt}S\_1\_0\_0 = v_{63} + v_{141} + v_{211} + v_{281} - v_{64} - v_{142} - v_{212} - v_{280} \tag{651}$$

6.52 Species S_1_0_1

Name Scaffold_MAPK-P_MEK_RAF-P

Initial amount 0 mol

This species takes part in eight reactions (as a reactant in `Reaction66`, `Reaction144`, `Reaction214`, `Reaction249` and as a product in `Reaction65`, `Reaction143`, `Reaction213`, `Reaction282`).

$$\frac{d}{dt}\text{S\_1\_0\_1} = v_{65} + v_{143} + v_{213} + v_{282} - v_{66} - v_{144} - v_{214} - v_{249} \tag{652}$$

6.53 Species S_1_1_m1

Name Scaffold_MAPK-P_MEK-P

Initial amount 0 mol

This species takes part in eight reactions (as a reactant in `Reaction68`, `Reaction146`, `Reaction215`, `Reaction217` and as a product in `Reaction67`, `Reaction145`, `Reaction216`, `Reaction218`).

$$\frac{d}{dt}\text{S\_1\_1\_m1} = v_{67} + v_{145} + v_{216} + v_{218} - v_{68} - v_{146} - v_{215} - v_{217} \tag{653}$$

6.54 Species S_1_1_0

Name Scaffold_MAPK-P_MEK-P_RAF

Initial amount 0 mol

This species takes part in eight reactions (as a reactant in `Reaction70`, `Reaction148`, `Reaction216`, `Reaction283` and as a product in `Reaction69`, `Reaction147`, `Reaction215`, `Reaction284`).

$$\frac{d}{dt}\text{S\_1\_1\_0} = v_{69} + v_{147} + v_{215} + v_{284} - v_{70} - v_{148} - v_{216} - v_{283} \tag{654}$$

6.55 Species S_1_1_1

Name Scaffold_MAPK-P_MEK-P_RAF-P

Initial amount 0 mol

This species takes part in nine reactions (as a reactant in `Reaction72`, `Reaction150`, `Reaction218`, `Reaction250` and as a product in `Reaction71`, `Reaction149`, `Reaction217`, `Reaction249`, `Reaction285`).

$$\frac{d}{dt}\text{S\_1\_1\_1} = v_{71} + v_{149} + v_{217} + v_{249} + v_{285} - v_{72} - v_{150} - v_{218} - v_{250} \tag{655}$$

6.56 Species S_1_2_m1

Name Scaffold_MAPK-P_MEK-PP

Initial amount 0 mol

This species takes part in ten reactions (as a reactant in `Reaction74`, `Reaction152`, `Reaction219`, `Reaction221`, `Reaction242` and as a product in `Reaction73`, `Reaction151`, `Reaction220`, `Reaction222`, `Reaction239`).

$$\frac{d}{dt}\text{S\_1\_2\_m1} = v_{73} + v_{151} + v_{220} + v_{222} + v_{239} - v_{74} - v_{152} - v_{219} - v_{221} - v_{242}$$

(656)

6.57 Species S_1_2_0

Name Scaffold_MAPK-P_MEK-PP_RAF

Initial amount 0 mol

This species takes part in ten reactions (as a reactant in `Reaction76`, `Reaction154`, `Reaction220`, `Reaction243`, `Reaction286` and as a product in `Reaction75`, `Reaction153`, `Reaction219`, `Reaction240`, `Reaction287`).

$$\frac{d}{dt}\text{S\_1\_2\_0} = v_{75} + v_{153} + v_{219} + v_{240} + v_{287} - v_{76} - v_{154} - v_{220} - v_{243} - v_{286} \quad (657)$$

6.58 Species S_1_2_1

Name Scaffold_MAPK-P_MEK-PP_RAF-P

Initial amount 0 mol

This species takes part in ten reactions (as a reactant in `Reaction78`, `Reaction156`, `Reaction222`, `Reaction244` and as a product in `Reaction77`, `Reaction155`, `Reaction221`, `Reaction241`, `Reaction250`, `Reaction288`).

$$\frac{d}{dt}\text{S\_1\_2\_1} = v_{77} + v_{155} + v_{221} + v_{241} + v_{250} + v_{288} - v_{78} - v_{156} - v_{222} - v_{244} \quad (658)$$

6.59 Species S_2_m1_m1

Name Scaffold_MAPK-PP

Initial amount 0 mol

This species takes part in twelve reactions (as a reactant in `Reaction80`, `Reaction157`, `Reaction163`, `Reaction169`, `Reaction223`, `Reaction225` and as a product in `Reaction79`, `Reaction158`, `Reaction164`, `Reaction170`, `Reaction224`, `Reaction226`).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{S\_2\_m1\_m1} = v_{79} + v_{158} + v_{164} + v_{170} + v_{224} + v_{226} \tag{659}$$
$$- v_{80} - v_{157} - v_{163} - v_{169} - v_{223} - v_{225}$$

6.60 Species S_2_m1_0

Name Scaffold_MAPK-PP_RAF

Initial amount 0 mol

This species takes part in twelve reactions (as a reactant in `Reaction82`, `Reaction159`, `Reaction165`, `Reaction171`, `Reaction224`, `Reaction289` and as a product in `Reaction81`, `Reaction160`, `Reaction166`, `Reaction172`, `Reaction223`, `Reaction290`).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{S\_2\_m1\_0} = v_{81} + v_{160} + v_{166} + v_{172} + v_{223} + v_{290} \tag{660}$$
$$- v_{82} - v_{159} - v_{165} - v_{171} - v_{224} - v_{289}$$

6.61 Species S_2_m1_1

Name Scaffold_MAPK-PP_RAF-P

Initial amount 0 mol

This species takes part in eleven reactions (as a reactant in `Reaction84`, `Reaction161`, `Reaction167`, `Reaction173`, `Reaction226` and as a product in `Reaction83`, `Reaction162`, `Reaction168`, `Reaction174`, `Reaction225`, `Reaction291`).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{S\_2\_m1\_1} = v_{83} + v_{162} + v_{168} + v_{174} + v_{225} + v_{291} \tag{661}$$
$$- v_{84} - v_{161} - v_{167} - v_{173} - v_{226}$$

6.62 Species S_2_0_m1

Name Scaffold_MAPK-PP_MEK

Initial amount 0 mol

This species takes part in eight reactions (as a reactant in `Reaction86`, `Reaction158`, `Reaction227`, `Reaction229` and as a product in `Reaction85`, `Reaction157`, `Reaction228`, `Reaction230`).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{S\_2\_0\_m1} = v_{85} + v_{157} + v_{228} + v_{230} - v_{86} - v_{158} - v_{227} - v_{229} \tag{662}$$

6.63 Species S_2_0_0

Name Scaffold_MAPK-PP_MEK_RAF

Initial amount 0 mol

This species takes part in eight reactions (as a reactant in `Reaction88`, `Reaction160`, `Reaction228`, `Reaction292` and as a product in `Reaction87`, `Reaction159`, `Reaction227`, `Reaction293`).

$$\frac{d}{dt}S\_2\_0\_0 = v_{87} + v_{159} + v_{227} + v_{293} - v_{88} - v_{160} - v_{228} - v_{292} \quad (663)$$

6.64 Species S_2_0_1

Name Scaffold_MAPK-PP_MEK_RAF-P

Initial amount 0 mol

This species takes part in eight reactions (as a reactant in `Reaction90`, `Reaction162`, `Reaction230`, `Reaction251` and as a product in `Reaction89`, `Reaction161`, `Reaction229`, `Reaction294`).

$$\frac{d}{dt}S\_2\_0\_1 = v_{89} + v_{161} + v_{229} + v_{294} - v_{90} - v_{162} - v_{230} - v_{251} \quad (664)$$

6.65 Species S_2_1_m1

Name Scaffold_MAPK-PP_MEK-P

Initial amount 0 mol

This species takes part in eight reactions (as a reactant in `Reaction92`, `Reaction164`, `Reaction231`, `Reaction233` and as a product in `Reaction91`, `Reaction163`, `Reaction232`, `Reaction234`).

$$\frac{d}{dt}S\_2\_1\_m1 = v_{91} + v_{163} + v_{232} + v_{234} - v_{92} - v_{164} - v_{231} - v_{233} \quad (665)$$

6.66 Species S_2_1_0

Name Scaffold_MAPK-PP_MEK-P_RAF

Initial amount 0 mol

This species takes part in eight reactions (as a reactant in `Reaction94`, `Reaction166`, `Reaction232`, `Reaction295` and as a product in `Reaction93`, `Reaction165`, `Reaction231`, `Reaction296`).

$$\frac{d}{dt}S\_2\_1\_0 = v_{93} + v_{165} + v_{231} + v_{296} - v_{94} - v_{166} - v_{232} - v_{295} \quad (666)$$

6.67 Species S_2_1_1

Name Scaffold_MAPK-PP_MEK-P_RAF-P

Initial amount 0 mol

This species takes part in nine reactions (as a reactant in Reaction96, Reaction168, Reaction234, Reaction252 and as a product in Reaction95, Reaction167, Reaction233, Reaction251, Reaction297).

$$\frac{d}{dt}S\_2\_1\_1 = v_{95} + v_{167} + v_{233} + v_{251} + v_{297} - v_{96} - v_{168} - v_{234} - v_{252} \quad (667)$$

6.68 Species S_2_2_m1

Name Scaffold_MAPK-PP_MEK-PP

Initial amount 0 mol

This species takes part in nine reactions (as a reactant in Reaction98, Reaction170, Reaction235, Reaction237 and as a product in Reaction97, Reaction169, Reaction236, Reaction238, Reaction242).

$$\frac{d}{dt}S\_2\_2\_m1 = v_{97} + v_{169} + v_{236} + v_{238} + v_{242} - v_{98} - v_{170} - v_{235} - v_{237} \quad (668)$$

6.69 Species S_2_2_0

Name Scaffold_MAPK-PP_MEK-PP_RAF

Initial amount 0 mol

This species takes part in nine reactions (as a reactant in Reaction100, Reaction172, Reaction236, Reaction298 and as a product in Reaction99, Reaction171, Reaction235, Reaction243, Reaction299).

$$\frac{d}{dt}S\_2\_2\_0 = v_{99} + v_{171} + v_{235} + v_{243} + v_{299} - v_{100} - v_{172} - v_{236} - v_{298} \quad (669)$$

6.70 Species S_2_2_1

Name Scaffold_MAPK-PP_MEK-PP_RAF-P

Initial amount 0 mol

This species takes part in nine reactions (as a reactant in Reaction102, Reaction174, Reaction238 and as a product in Reaction101, Reaction173, Reaction237, Reaction244, Reaction252, Reaction300).

$$\frac{d}{dt}S\_2\_2\_1 = v_{101} + v_{173} + v_{237} + v_{244} + v_{252} + v_{300} - v_{102} - v_{174} - v_{238} \quad (670)$$

6.71 Species S_RAFK_m1_m1_0

Name Scaffold_RAF

Initial amount 0 mol

This species takes part in three reactions (as a reactant in `Reaction254`, `Reaction255` and as a product in `Reaction253`).

$$\frac{d}{dt}\text{S\_RAFK\_m1\_m1\_0} = v_{253} - v_{254} - v_{255} \tag{671}$$

6.72 Species S_RAFK_m1_0_0

Name Scaffold_MEK_RAF

Initial amount 0 mol

This species takes part in three reactions (as a reactant in `Reaction257`, `Reaction258` and as a product in `Reaction256`).

$$\frac{d}{dt}\text{S\_RAFK\_m1\_0\_0} = v_{256} - v_{257} - v_{258} \tag{672}$$

6.73 Species S_RAFK_m1_1_0

Name Scaffold_MEK-P_RAF

Initial amount 0 mol

This species takes part in three reactions (as a reactant in `Reaction260`, `Reaction261` and as a product in `Reaction259`).

$$\frac{d}{dt}\text{S\_RAFK\_m1\_1\_0} = v_{259} - v_{260} - v_{261} \tag{673}$$

6.74 Species S_RAFK_m1_2_0

Name Scaffold_MEK-PP_RAF

Initial amount 0 mol

This species takes part in three reactions (as a reactant in `Reaction263`, `Reaction264` and as a product in `Reaction262`).

$$\frac{d}{dt}\text{S\_RAFK\_m1\_2\_0} = v_{262} - v_{263} - v_{264} \tag{674}$$

6.75 Species S_RAFK_0_m1_0

Name Scaffold_MAPK_RAF

Initial amount 0 mol

This species takes part in three reactions (as a reactant in `Reaction266`, `Reaction267` and as a product in `Reaction265`).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{S\_RAFK\_0\_m1\_0} = v_{265} - v_{266} - v_{267} \tag{675}$$

6.76 Species S_RAFK_0_0_0

Name Scaffold_MAPK_MEK_RAF

Initial amount 0 mol

This species takes part in three reactions (as a reactant in `Reaction269`, `Reaction270` and as a product in `Reaction268`).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{S\_RAFK\_0\_0\_0} = v_{268} - v_{269} - v_{270} \tag{676}$$

6.77 Species S_RAFK_0_1_0

Name Scaffold_MAPK_MEK-P_RAF

Initial amount 0 mol

This species takes part in three reactions (as a reactant in `Reaction272`, `Reaction273` and as a product in `Reaction271`).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{S\_RAFK\_0\_1\_0} = v_{271} - v_{272} - v_{273} \tag{677}$$

6.78 Species S_RAFK_0_2_0

Name Scaffold_MAPK_MEK-PP_RAF

Initial amount 0 mol

This species takes part in three reactions (as a reactant in `Reaction275`, `Reaction276` and as a product in `Reaction274`).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{S\_RAFK\_0\_2\_0} = v_{274} - v_{275} - v_{276} \tag{678}$$

6.79 Species S_RAFK_1_m1_0

Name Scaffold_MAPK-P_RAF

Initial amount 0 mol

This species takes part in three reactions (as a reactant in Reaction278, Reaction279 and as a product in Reaction277).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{S\_RAFK\_1\_m1\_0} = v_{277} - v_{278} - v_{279} \tag{679}$$

6.80 Species S_RAFK_1_0_0

Name Scaffold_MAPK-P_MEK_RAF

Initial amount 0 mol

This species takes part in three reactions (as a reactant in Reaction281, Reaction282 and as a product in Reaction280).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{S\_RAFK\_1\_0\_0} = v_{280} - v_{281} - v_{282} \tag{680}$$

6.81 Species S_RAFK_1_1_0

Name Scaffold_MAPK-P_MEK-P_RAF

Initial amount 0 mol

This species takes part in three reactions (as a reactant in Reaction284, Reaction285 and as a product in Reaction283).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{S\_RAFK\_1\_1\_0} = v_{283} - v_{284} - v_{285} \tag{681}$$

6.82 Species S_RAFK_1_2_0

Name Scaffold_MAPK-P_MEK-PP_RAF

Initial amount 0 mol

This species takes part in three reactions (as a reactant in Reaction287, Reaction288 and as a product in Reaction286).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{S\_RAFK\_1\_2\_0} = v_{286} - v_{287} - v_{288} \tag{682}$$

6.83 Species S_RAFK_2_m1_0

Name Scaffold_MAPK-PP_RAF

Initial amount 0 mol

This species takes part in three reactions (as a reactant in `Reaction290`, `Reaction291` and as a product in `Reaction289`).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{S\_RAFK\_2\_m1\_0} = v_{289} - v_{290} - v_{291} \tag{683}$$

6.84 Species S_RAFK_2_0_0

Name Scaffold_MAPK-PP_MEK_RAF

Initial amount 0 mol

This species takes part in three reactions (as a reactant in `Reaction293`, `Reaction294` and as a product in `Reaction292`).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{S\_RAFK\_2\_0\_0} = v_{292} - v_{293} - v_{294} \tag{684}$$

6.85 Species S_RAFK_2_1_0

Name Scaffold_MAPK-PP_MEK-P_RAF

Initial amount 0 mol

This species takes part in three reactions (as a reactant in `Reaction296`, `Reaction297` and as a product in `Reaction295`).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{S\_RAFK\_2\_1\_0} = v_{295} - v_{296} - v_{297} \tag{685}$$

6.86 Species S_RAFK_2_2_0

Name Scaffold_MAPK-PP_MEK-PP_RAF

Initial amount 0 mol

This species takes part in three reactions (as a reactant in `Reaction299`, `Reaction300` and as a product in `Reaction298`).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{S\_RAFK\_2\_2\_0} = v_{298} - v_{299} - v_{300} \tag{686}$$

SBML2LATEX was developed by Andreas Dräger[a], Hannes Planatscher[a], Dieudonné M Wouamba[a], Adrian Schröder[a], Michael Hucka[b], Lukas Endler[c], Martin Golebiewski[d] and Andreas Zell[a]. Please see http://www.ra.cs.uni-tuebingen.de/software/SBML2LaTeX for more information.

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