







	tC	tΡ	tN	tAce	tH2O	Res	Fer	NTS	AAS	LipS	Deg	DNAp	tRNAp	mRNAp	rRNAp	tRNAc	r
С	1	0	0	0	0	-0.01	-0.15	-0.26	-0.25	-0.88	Ŏ	Ō	Ö	0	Ö	0	0
Р	0	1	0	0	0	-0.16	-0.13	0.1	0.1	-0.1	0	0	0	0	0	0	0
N	0	0	1	0	0	0	0	0	-0.04	-0.02	0	0	0	0	0	0	0
w	0	0	0	-1	0	0.01	0.15	0	0	0	0	0	0	0	0	0	0
H2O	0	0	0	0	1	0.01	0	0	0	0	0	0	0	0	0	0	0
ADP	0	0	0	0	0	-0.83	-0.71	0.51	0.6	0	0	0	0	0	0	0.1	0.1
ATP	0	0	0	0	0	0.98	0.84	-0.61	-0.71	0	0	0	0	0	0	-0.1	-0.1
AA	0	0	0	0	0	0	0	-0.13	0.3	0	0	0	0	0	0	-0.2	0
NT	0	0	0	0	0	0	0	0.39	0	0	1	-1	-1	-1	-1	0	0
Lip	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
DNA	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
tRNA	0	0	0	0	0	0	0	0	0	0	-0.1	0	1	0	0	-0.7	0.1
mRNA	0	0	0	0	0	0	0	0	0	0	-0.1	0	0	1	0	0	0
rRNA	0	0	0	0	0	0	0	0	0	0	-0.8	0	0	0	1	0	0
TC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.9	-0.9
Р	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8.0

	tC	tΡ	tN	tAce	tH2O	Res	Fer	NTS	AAS	LipS	Deg	DNAp	tRNAp	mRNAp	rRNAp	tRNAc	r
x_C	1	0	0	0	0	0	0	0	0	0	ō	Ö	Ö	Ö	Ö	0	0
x_P	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
x_N	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
x_Ace	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
x_H2O	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
_ C	4	0	0	0	0	3.6	4	4	4	4	0	0	0	0	0	0	0
P	0	0	0	0	0	0.9	1	1	1	1	0	0	0	0	0	0	0
N	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0
W	0	0	0	49	0	0	49	0	0	0	0	0	0	0	0	0	0
H2O ADP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ADP	0	0	0	0	0	3.6	4	4	4	0	0	0	0	0	0	4	4
ATP	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	2	2
AA	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	2	0
NT	0	0	0	0	0	0	0	0	0	0	2	2	2	2	2	0	0
Lip	0	0	0	0	0	0	0	0	0	55	0	0	0	0	0	0	0
DNA	0	0	0	0	0	0	0	0	0	0	0	11	0	0	0	0	0
tRNA	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	1	0
mRNA	0	0	0	0	0	0	0	0	0	0	2	0	0	2	0	0	0
rRNA	0	0	0	0	0	0	0	0	0	0	14	0	0	0	14	0	0
TC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2
Р	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	tC	tP	tN	tAce	tH2O	Res	Fer	NTS	AAS	LipS	Deg	DNAp	RNAp	mRNAp	rRNAp	tRNAc	r
x_C	0	0	0	0	0	0	0	0	0	. 0	ō	Ö	Ö	Ö	Ö	0	0
x_C x_P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
x_N	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
x_Ace	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
x_H2O	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
С	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Р	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
N	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
W	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H2O	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ADP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ATP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
AA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lip DNA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DNA	0	0	0	0	0	0	0	0	0	0	0	10	10	10	10	0	0
tRNA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
mRNA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
rRNA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	50
TC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Р	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

### kcat

	tC	tΡ	tN	tAce	tH2O	Res	Fer	NTS	AAS	LipS	Deg	DNAp	tRNAp	mRNAp	rRNAp	tRNAc	r
kcatf	19	8	8	272	41176	10	20	185	298	118	10	11	152	1	7	67	20
kcath	2	1	1	27	4118	1	2	18	30	12	0	0	0	0	0	0	0

# Keq



# phi input

[,**7]** [,**8**] 0.15 0.1

**[,9]** 0.05 **[,10] [,11]** 0.02 0.01

**[,12]** 0.01

**[,13]** 0.01 **[,14]** 0.01 **[,15]** 0.02 **[,17]** 0.25

[,5] [,6] 1e-04 0.1

**[,4]** 0.001

[1,]

average saturation input

# minimal phi constraint

[,**12]** 0

**[,11]** 0.003 [,13] [,14] [,15] [,16] 0 0 0 0

**[,17]** 0

[,1] [,2] [,3] [,4] [,5] [,6] [,7] [,8] [,9] [,10] 0 0 0 0 0 0 0 0

[,1] [,2] [,3] [,4] [,5] [,6] [,7] [,8] [,9] [,10] [,11] [,12] [,13] [,14] [,15] [,16] [,17] 0 0 0 0 0.7 0 0 0 0 0.05 0 0 0 0 0 0 0 0

[1,]