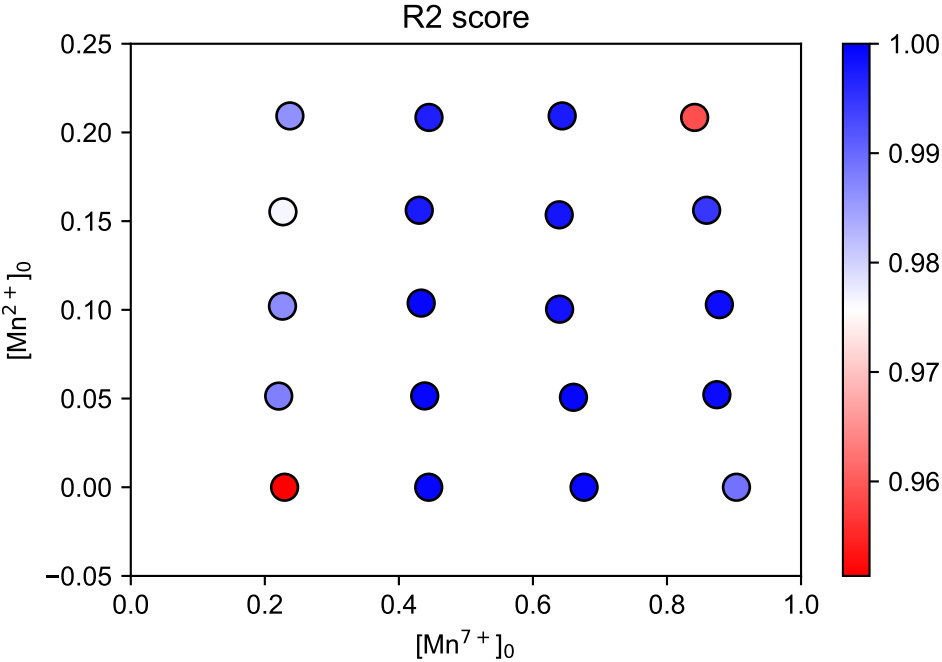


path: result/sparse\_12\_split  
filename: 0000

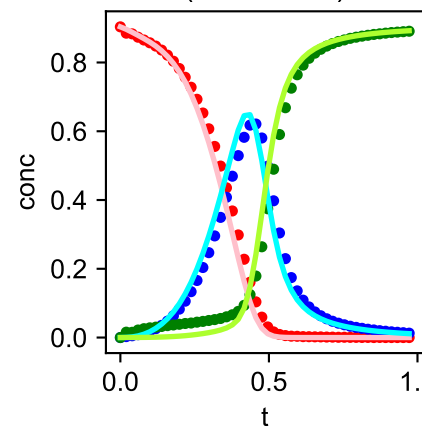
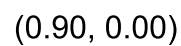
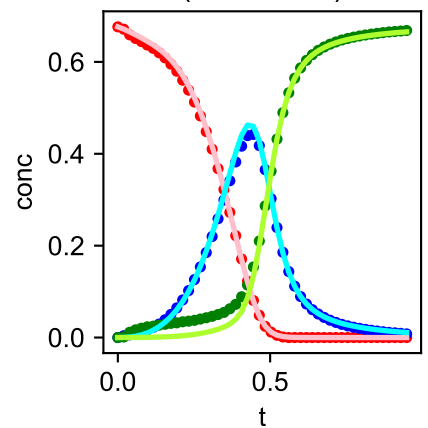
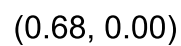
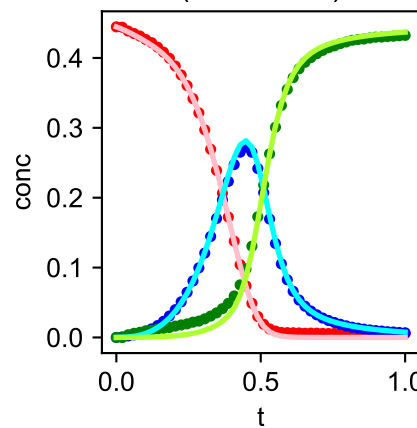
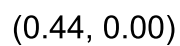
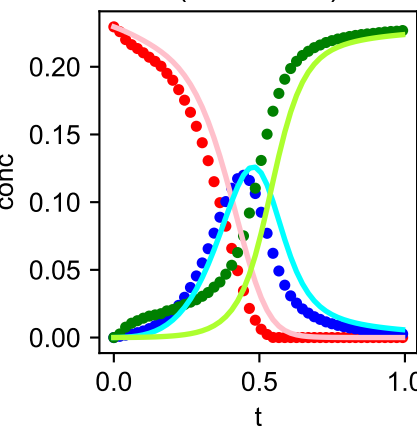
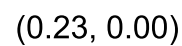
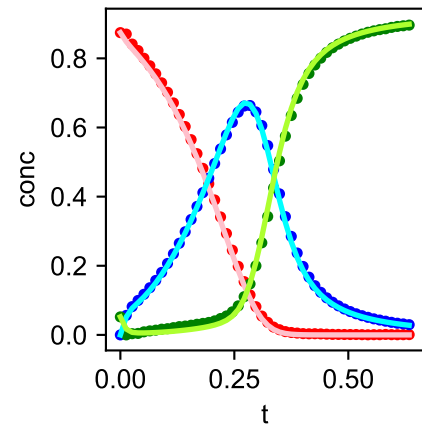
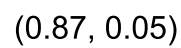
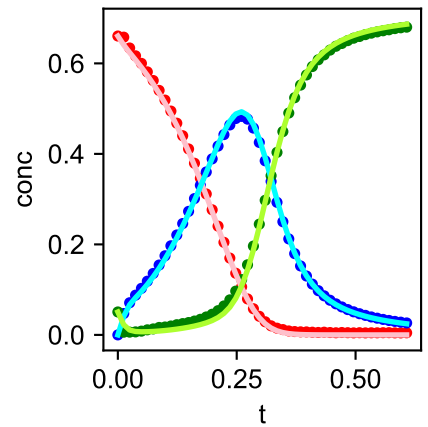
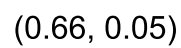
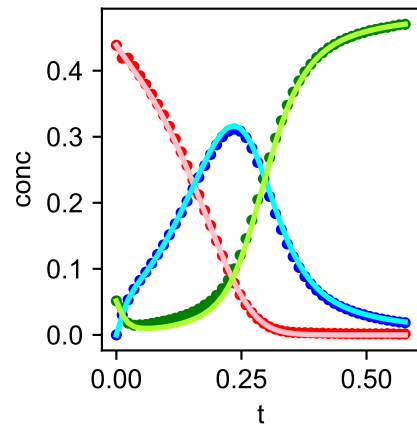
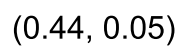
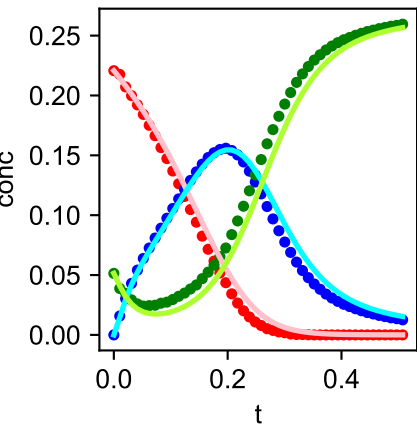
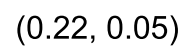
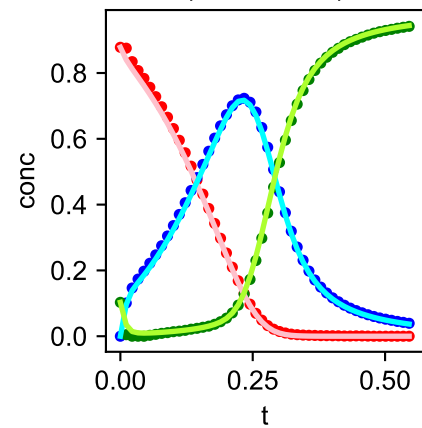
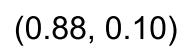
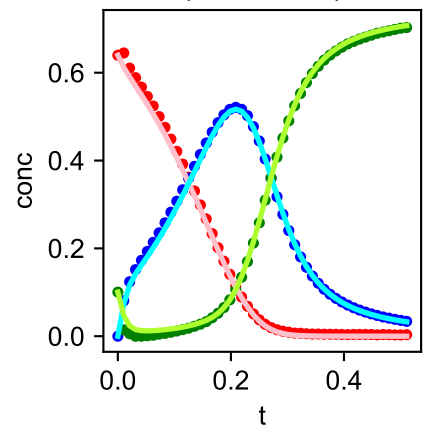
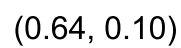
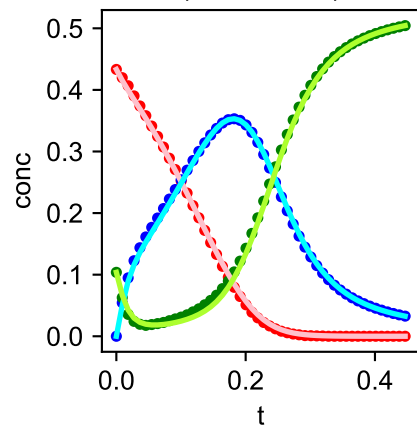
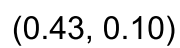
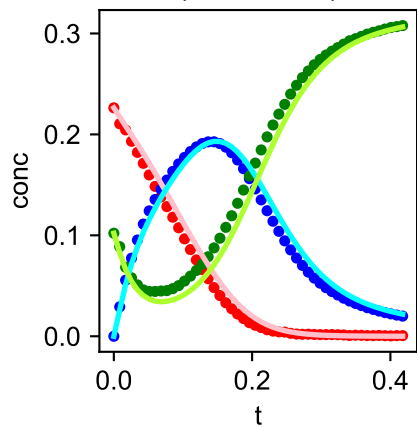
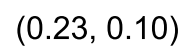
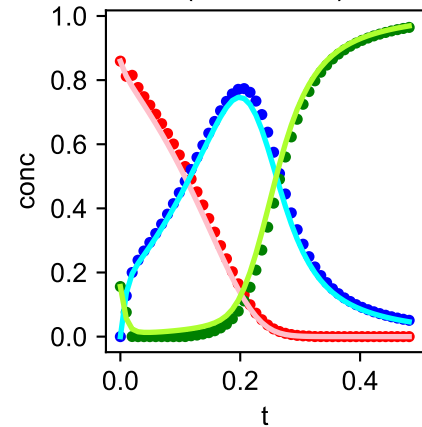
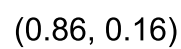
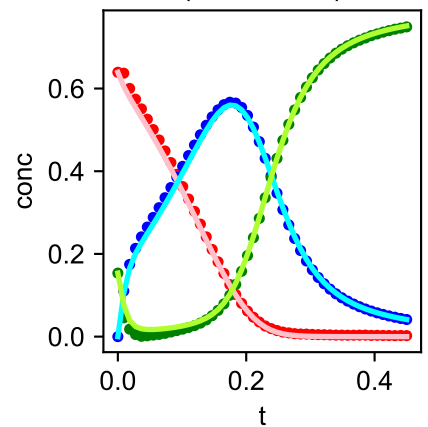
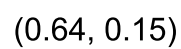
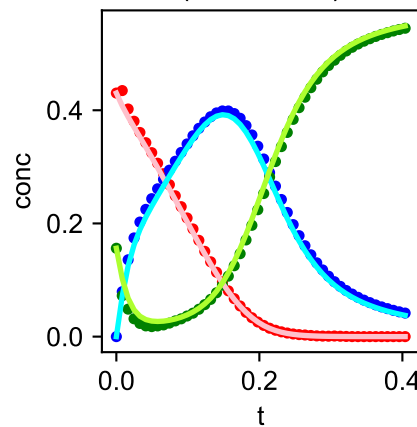
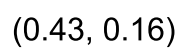
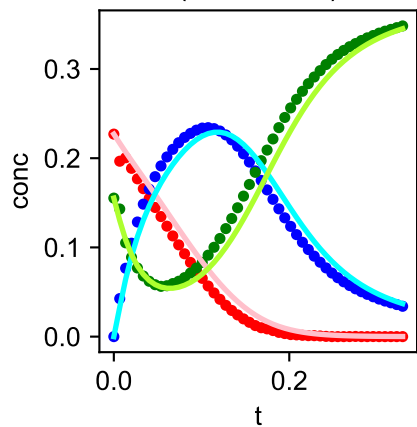
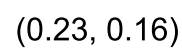
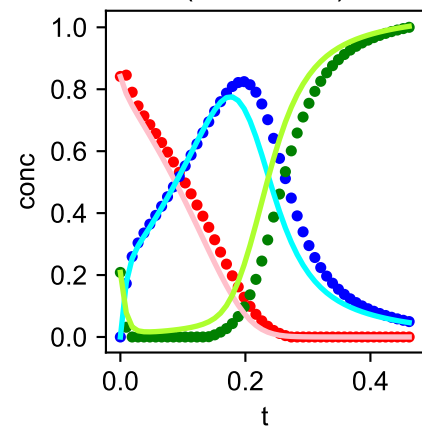
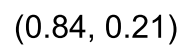
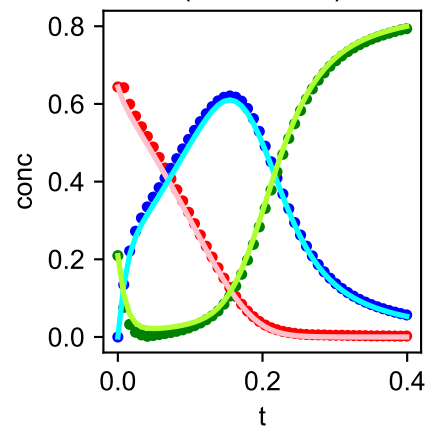
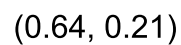
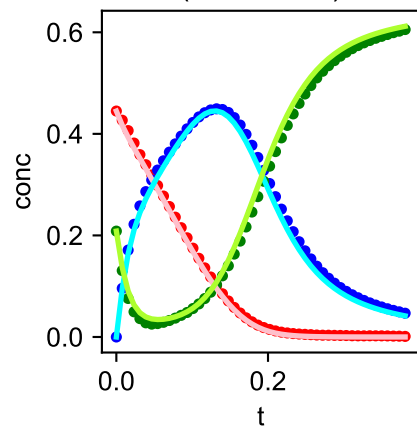
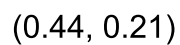
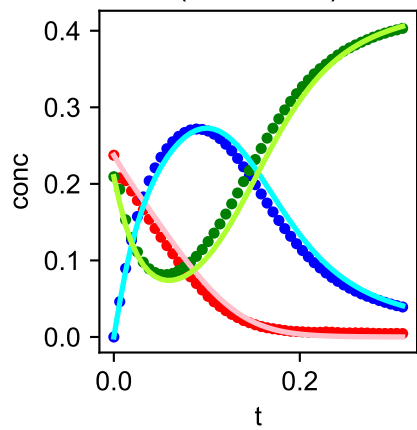
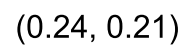
chem formula:  
['Mn+7', 'Mn+3', 'Mn+2', 'C2O4-2',  
'CO2', 'Mn+6', 'Mn+5', 'Mn+4', 'C2O4-1',  
'CO2-1']

k\_max = 1.00e+04  
k\_cut = 1.00e-02  
lam = 0.00e+00  
num\_eq = 64  
loss = 1.27e-03

MRSE train = 1.27e-03  
MESE test = 1.47e-02



( 1) C204-1	-> C02 + C02-1	k = 1.94	(41) 2 Mn+4	-> Mn+2 + Mn+6	k = 222.33
( 2) 2 C02-1	-> C204-2	k = 9532.45	(42) Mn+4 + C204-1	-> C204-2 + Mn+5	k = 9828.63
( 3) Mn+7 + Mn+3	-> Mn+6 + Mn+4	k = 0.39	(43) Mn+4 + C02-1	-> Mn+3 + C02	k = 629.80
( 4) Mn+7 + Mn+3	-> 2 Mn+5	k = 0.88	(44) C204-1 + C02-1	-> C204-2 + C02	k = 32.20
( 5) Mn+7 + Mn+2	-> Mn+3 + Mn+6	k = 10.24	(45) Mn+7 + C204-2	-> 2 C02 + Mn+5	k = 0.03
( 6) Mn+7 + Mn+2	-> Mn+5 + Mn+4	k = 28.09	(46) Mn+7 + C204-2	-> C02 + Mn+6 + C02-1	k = 0.00
( 7) Mn+7 + C204-2	-> Mn+6 + C204-1	k = 0.29	(47) Mn+7 + C204-1	-> 2 C02 + Mn+6	k = 29.74
( 8) Mn+7 + Mn+5	-> 2 Mn+6	k = 9.69	(48) Mn+3 + C204-2	-> Mn+2 + C02 + C02-1	k = 3.89
( 9) Mn+7 + Mn+4	-> Mn+6 + Mn+5	k = 15.15	(49) Mn+3 + C204-1	-> Mn+2 + 2 C02	k = 74.47
(10) Mn+7 + C02-1	-> C02 + Mn+6	k = 4398.06	(50) Mn+3 + C204-1	-> Mn+4 + 2 C02-1	k = 0.02
(11) 2 Mn+3	-> Mn+2 + Mn+4	k = 0.00	(51) Mn+2 + C204-1	-> Mn+3 + 2 C02-1	k = 2.30
(12) Mn+3 + C204-2	-> Mn+2 + C204-1	k = 8.38	(52) C204-2 + Mn+6	-> 2 C02 + Mn+4	k = 0.66
(13) Mn+3 + Mn+6	-> Mn+7 + Mn+2	k = 3.25	(53) C204-2 + Mn+6	-> C02 + Mn+5 + C02-1	k = 0.26
(14) Mn+3 + Mn+6	-> Mn+5 + Mn+4	k = 14.11	(54) C204-2 + Mn+5	-> Mn+3 + 2 C02	k = 1059.32
(15) Mn+3 + Mn+5	-> Mn+2 + Mn+6	k = 0.02	(55) C204-2 + Mn+5	-> C02 + Mn+4 + C02-1	k = 238.76
(16) Mn+3 + Mn+5	-> 2 Mn+4	k = 1966.58	(56) C204-2 + Mn+4	-> Mn+3 + C02 + C02-1	k = 90.45
(17) Mn+3 + Mn+4	-> Mn+2 + Mn+5	k = 4.05	(57) C204-2 + Mn+4	-> Mn+2 + 2 C02	k = 0.33
(18) Mn+3 + C204-1	-> C204-2 + Mn+4	k = 0.00	(58) Mn+6 + C204-1	-> Mn+7 + 2 C02-1	k = 5.46
(19) Mn+3 + C02-1	-> Mn+2 + C02	k = 358.73	(59) Mn+6 + C204-1	-> 2 C02 + Mn+5	k = 189.84
(20) Mn+2 + Mn+6	-> Mn+3 + Mn+5	k = 9999.25	(60) Mn+5 + C204-1	-> 2 C02 + Mn+4	k = 675.38
(21) Mn+2 + Mn+6	-> 2 Mn+4	k = 12.33	(61) Mn+5 + C204-1	-> Mn+6 + 2 C02-1	k = 1.26
(22) Mn+2 + Mn+5	-> Mn+3 + Mn+4	k = 9999.98	(62) Mn+4 + C204-1	-> Mn+3 + 2 C02	k = 5.88
(23) Mn+2 + Mn+4	-> 2 Mn+3	k = 9998.21	(63) Mn+4 + C204-1	-> Mn+5 + 2 C02-1	k = 7.92
(24) Mn+2 + C204-1	-> Mn+3 + C204-2	k = 17.42	(64) 2 C204-1	-> C204-2 + 2 C02	k = 5.70
(25) C204-2 + Mn+6	-> Mn+5 + C204-1	k = 0.29			
(26) C204-2 + Mn+5	-> Mn+4 + C204-1	k = 191.34			
(27) C204-2 + Mn+4	-> Mn+3 + C204-1	k = 1.68			
(28) 2 Mn+6	-> Mn+7 + Mn+5	k = 227.59			
(29) Mn+6 + Mn+5	-> Mn+7 + Mn+4	k = 1.41			
(30) Mn+6 + Mn+4	-> Mn+7 + Mn+3	k = 3776.60			
(31) Mn+6 + Mn+4	-> 2 Mn+5	k = 38.37			
(32) Mn+6 + C204-1	-> Mn+7 + C204-2	k = 137.31			
(33) Mn+6 + C02-1	-> C02 + Mn+5	k = 57.82			
(34) 2 Mn+5	-> Mn+7 + Mn+3	k = 1.77			
(35) 2 Mn+5	-> Mn+6 + Mn+4	k = 9682.87			
(36) Mn+5 + Mn+4	-> Mn+7 + Mn+2	k = 22.72			
(37) Mn+5 + Mn+4	-> Mn+3 + Mn+6	k = 9903.94			
(38) Mn+5 + C204-1	-> C204-2 + Mn+6	k = 552.72			
(39) Mn+5 + C02-1	-> C02 + Mn+4	k = 0.35			
(40) 2 Mn+4	-> Mn+3 + Mn+5	k = 94.24			


$$([Mn^{7+}]_0, [Mn^{2+}]_0)$$

—  $\text{sim}(\text{Mn}^{7+})$

— sim( $\text{Mn}^{3+}$ )

—  $\text{sim}(\text{Mn}^{2+})$

- $\exp(\text{Mn}^{7+})$

- $\exp(\text{Mn}^{3+})$

- $\exp(\text{Mn}^{2+})$