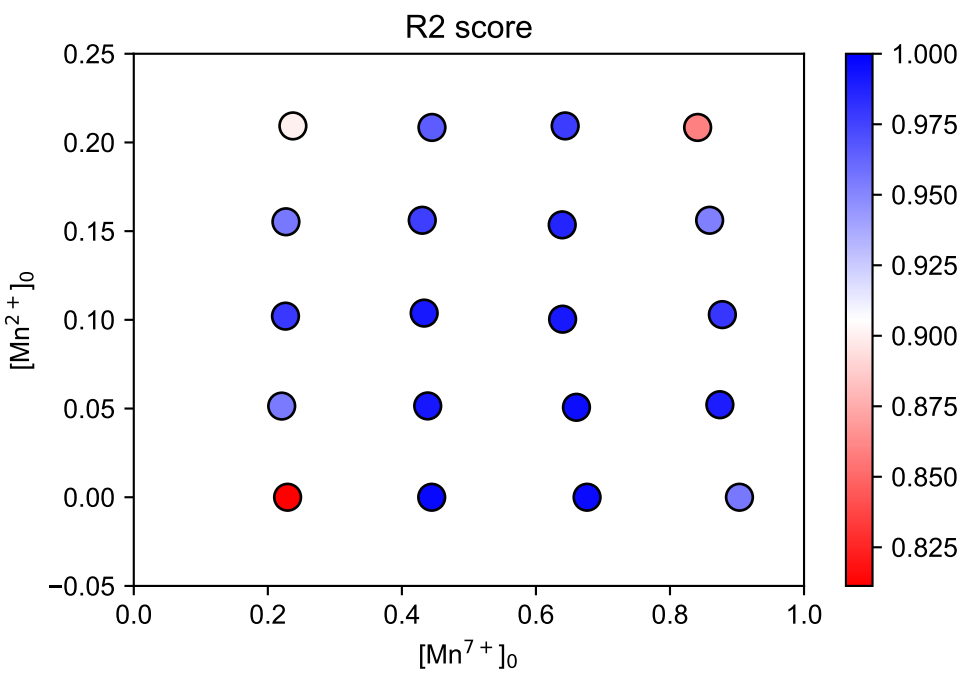
path: result/sparse_numerical_split
filename: 0000

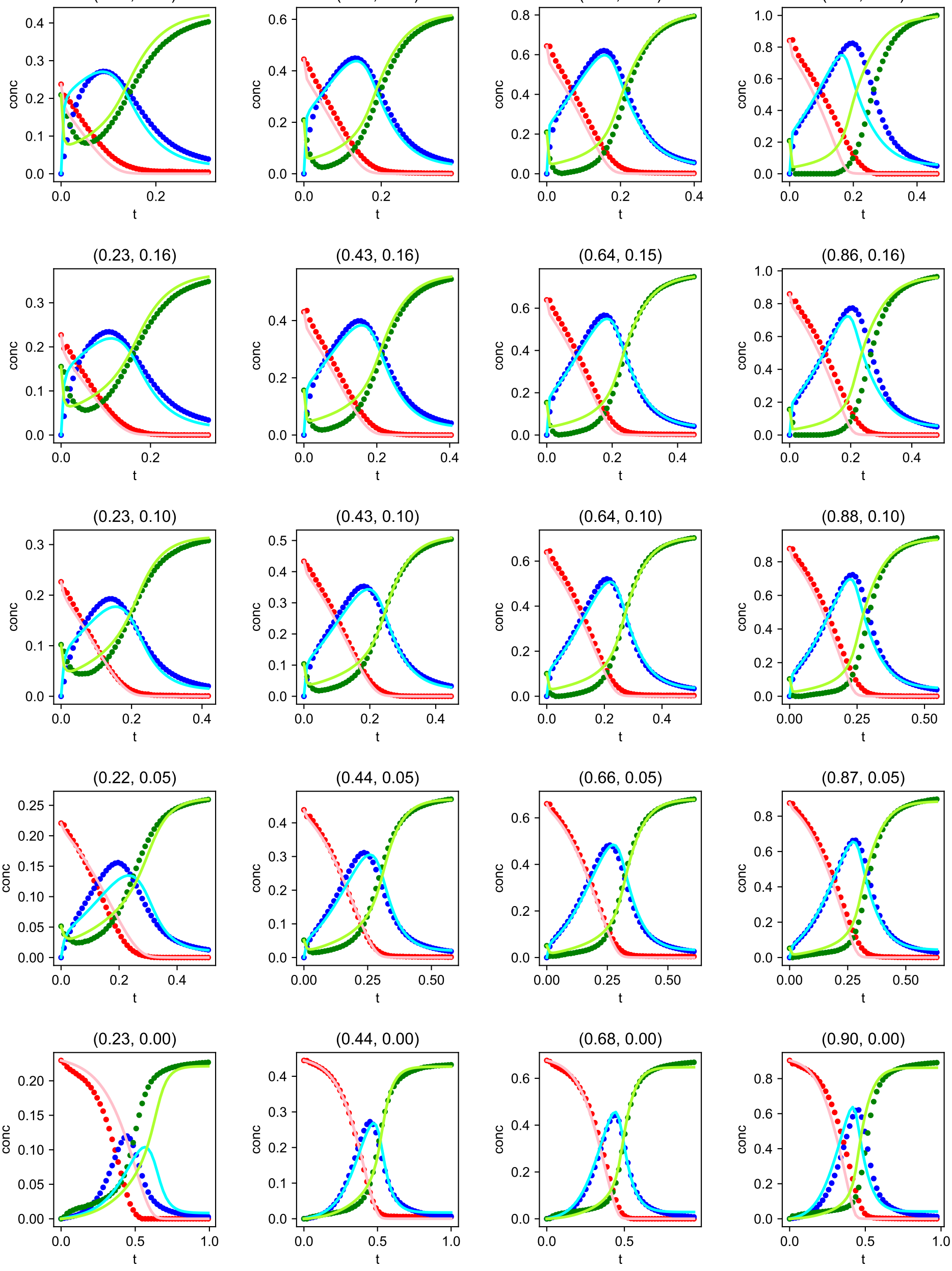
chem formula:
['Mn+7', 'Mn+3', 'Mn+2']

k_max = 1.00e+04
k_cut = 1.00e-02
lam = 0.00e+00
num_eq = 18
loss = 9.60e-03

MRSE train = 9.60e-03
MESE test = 5.99e-02




```
( 1) Mn+7              -> Mn+3             k = 0.25
( 2) Mn+3              -> Mn+7             k = 0.00
( 3) Mn+3              -> Mn+2             k = 19.02
( 4) Mn+2              -> Mn+3             k = 0.65
( 5) Mn+7 + Mn+2       -> 2 Mn+3           k = 66.77
( 6) 2 Mn+3            -> Mn+7 + Mn+2      k = 9.83
( 7) 2 Mn+3            -> 2 Mn+2           k = 0.00
( 8) 2 Mn+2            -> 2 Mn+3           k = 0.13
( 9) Mn+7 + 2 Mn+2     -> 3 Mn+3           k = 806.60
(10) 3 Mn+3            -> Mn+7 + 2 Mn+2    k = 0.00
(11) 3 Mn+3            -> 3 Mn+2           k = 0.00
(12) 3 Mn+2            -> 3 Mn+3           k = 0.00
(13) Mn+7 + 3 Mn+2     -> 4 Mn+3           k = 9999.98
(14) 4 Mn+3            -> Mn+7 + 3 Mn+2    k = 0.00
(15) 4 Mn+3            -> 4 Mn+2           k = 4.79
(16) 4 Mn+2            -> 4 Mn+3           k = 0.00
(17) Mn+7 + 4 Mn+2     -> 5 Mn+3           k = 16.22
(18) 5 Mn+3            -> Mn+7 + 4 Mn+2    k = 11.63
```


(0.24, 0.21)
(0.44, 0.21)
(0.64, 0.21)
(0.84, 0.21)
(0.23, 0.16)
(0.43, 0.16)
(0.64, 0.15)
(0.86, 0.16)
(0.23, 0.10)
(0.43, 0.10)
(0.64, 0.10)
(0.88, 0.10)
(0.22, 0.05)
(0.44, 0.05)
(0.66, 0.05)
(0.87, 0.05)
(0.23, 0.00)
(0.44, 0.00)
(0.68, 0.00)
(0.90, 0.00)
conc
t
([Mn7+]0, [Mn2+]0)
sim(Mn7+)
sim(Mn3+)
sim(Mn2+)
exp(Mn7+)
exp(Mn3+)
exp(Mn2+)