

1, The rate of changes:

$$E: V_E = \frac{k_3[E_0][S]}{\frac{k_2+k_3}{k_1} + [S]}$$

$$S: V_S = k_2[ES] = \frac{k_2 V_p}{k_3}$$

$$P: V_p = \frac{k_3[E_0][S]}{\frac{k_2+k_3}{k_1} + [S]}$$

$$ES: V_{ES} = k_1[E][S] = (k_2 + k_3)[ES]$$

2,

$$\frac{k_2+k_3}{k_1} = 7.5, k_3[E_0] = 150$$

`f=@(x,y)(150/(x+7.5))-(y/(x+7.5));%This` is the function of  $V_p$

`x = 0: 0.5: 10;` %means the range of S

`y0 = 0;`

`y = RK (f, x, y0);`

`disp(y)` %out put the  $V_p$

`z=4*y`

`disp(z)`%out put the  $V_S$

`l=5*y`

`disp(l)` %out put the  $V_{ES}$

`function y = RK(f, x, y0)` %set the function

`y = 0 * x;`

`y(1) = y0;`

`h = x(2) - x(1);`

`n = length(x);`

`for m = 1 : n-1`

`k1 = f(x(m), y(m));`

`k2 = f(x(m)+h/2, y(m)+h*k1/2);`

`k3 = f(x(m)+h/2, y(m)+h*k2/2);`

`k4 = f(x(m)+h, y(m)+h*k3);`

`y(m+1) = y(m) + h*(k1 + 2*k2 + 2*k3 + k4) / 6;`

`end`

`end`

my result:

```
列 1 至 13
    0    9.3750    17.6471    25.0000    31.5789    37.5000    42.8571    47.7273    52.1739    56.2500    60.0000    63.4615    66.6667

列 14 至 21
    69.6429    72.4138    75.0000    77.4194    79.6875    81.8182    83.8235    85.7143

z = 1x21
    0    37.5000    70.5882    100.0000    126.3158    150.0000    171.4286    190.9091    208.6957    225.0000    240.0000    253.8462    266.6667    278.5714    289.6552    300.0000    309.6774 ...

列 1 至 13
    0    37.5000    70.5882    100.0000    126.3158    150.0000    171.4286    190.9091    208.6957    225.0000    240.0000    253.8462    266.6667

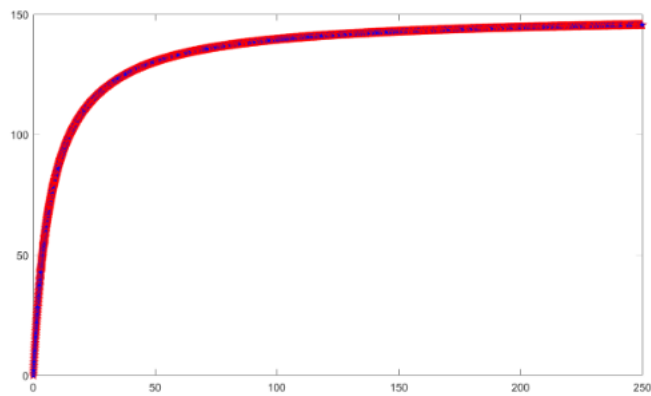
列 14 至 21
    278.5714    289.6552    300.0000    309.6774    318.7500    327.2727    335.2941    342.8571

l = 1x21
    0    46.8750    88.2353    125.0000    157.8947    187.5000    214.2857    238.6364    260.8696    281.2500    300.0000    317.3077    333.3333    348.2143    362.8696    375.0000    387.8968 ...

列 1 至 13
    0    46.8750    88.2353    125.0000    157.8947    187.5000    214.2857    238.6364    260.8696    281.2500    300.0000    317.3077    333.3333

列 14 至 21
    348.2143    362.8696    375.0000    387.8968    398.4375    409.0909    419.1176    428.5714
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3,



I can see that at lower concentrations, there is a straight line. And at higher concentrations, a stable value is reached, at which point it is the maximum value. The figure is nearly 145.