%oef4

%initiele condities

y0=[0.1 0 20]

%tijdsduur

tspan=[0 30]

%solver oproepen

[t y]=ode45(@batchgroei,tspan,y0)

%resultaat plotten

plot(t,y(:,1),'--',t,y(:,2),'r:',t,y(:,3),'-')

xlabel('Tijd (s)')

ylabel('Batchgroei (kg/m^3)')

legend('Biomassa', 'Product', 'Substraat')

function [ ydot ] = batchgroei(t,y )

%umax= 0.3

%Ks=0.1

%Yxs=0.8

%k1=0.05

%k2=0.1

X=y(1);

P=y(2);

S=y(3);

ydot=[(0.3\*(S/(0.1+S))\*X)

(0.05+0.1\*0.3\*(S/(0.1+S)))\*X

(-0.3\*(S/(0.1+S))\*X)/0.8];

end



%oef5

%initiele condities

y0=[1 0.01 10 0]

%tijdsduur

tspan=[0 100]

%solver oproepen

[t y]=ode45(@oef5,tspan,y0)

%resultaat plotten

plot(t,y(:,1),'--',t,y(:,2),'r:',t,y(:,3),'-',t,y(:,4),'c-')

xlabel('Tijd (u)')

ylabel('Fed-batchfermentatie (kg/m^3)')

legend('Mediumvolume', 'Substraat', 'Product', 'Biomassa')

function [ ydot ] = oef5(t,y)

%umax=0.3; Ks= 0.1; k1= 0.03; k2= 0.08, Yxs= 0.8

%F=0 voor batchfermentatie; F=1.5 voor fed-batchfermentatie

%Sf=10

if t<22.5

V=y(1)

X=y(2)

S=y(3)

P=y(4)

ydot=[0

(0.3\*(S/(0.1+S))\*X)

(-0.3\*(S/(0.1+S))\*X)/0.8

(0.03+0.08\*0.3\*(S/(0.1+S)))\*X];

else t>22.5

V=y(1)

X=y(2)

S=y(3)

P=y(4)

ydot=[1.5

(0.3\*(S/(0.1+S))\*X)-(X\*1.5/V)

10\*(10/V)\*((-0.3\*(S/(0.1+S))\*X)/0.8)-S\*(1.5/V)

((0.03+0.08\*0.3\*(S/(0.1+S)))\*X)-P\*(1.5/V)];

end