**Part A. Computation of the heat release rate and flashover time**

**A1**

**Matlab Code**

T = 600;

alpha1=0.002778; %Define cofficient alpha for slow medium

alpha2=0.011111; %Define cofficient alpha for medium medium

alpha3=0.044444; %Define cofficient alpha for fast medium

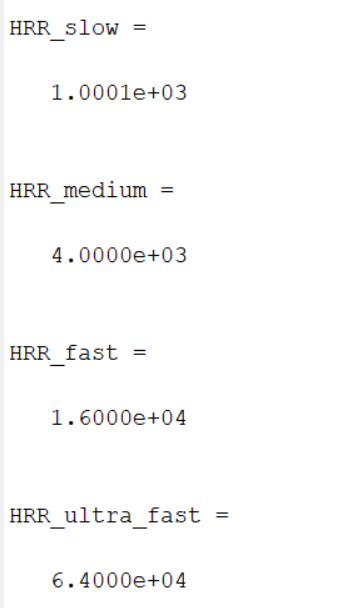
alpha4=0.177778; %Define cofficient alpha for ultra fast medium

HRR\_slow=alpha1\*T\*T

HRR\_medium=alpha2\*T\*T

HRR\_fast=alpha3\*T\*T

HRR\_ultra\_fast=alpha4\*T\*T

Output

**A2**

**Matlab Code**

T = 600;

alpha1=0.002778; %Define cofficient alpha for slow medium

alpha2=0.011111; %Define cofficient alpha for medium medium

alpha3=0.044444; %Define cofficient alpha for fast medium

alpha4=0.177778; %Define cofficient alpha for ultra fast medium

HRR\_slow=alpha1\*T\*T

HRR\_medium=alpha2\*T\*T

HRR\_fast=alpha3\*T\*T

HRR\_ultra\_fast=alpha4\*T\*T

x1 = linspace(0,10,150);

y1 = alpha1\*x1;

figure

plot(x1,y1)

xlabel('Time')

ylabel('Increase of temperature :Slow system')

x2 = linspace(0,10,150);

y2 = alpha2\*x2;

figure

plot(x2,y2)

xlabel('Time')

ylabel('Increase of temperature :Medium system')

x3 = linspace(0,10,150);

y3 = alpha3\*x3;

figure

plot(x3,y3)

xlabel('Time')

ylabel('Increase of temperature :Fast system')

x4 = linspace(0,10,150);

y4= alpha4\*x4;

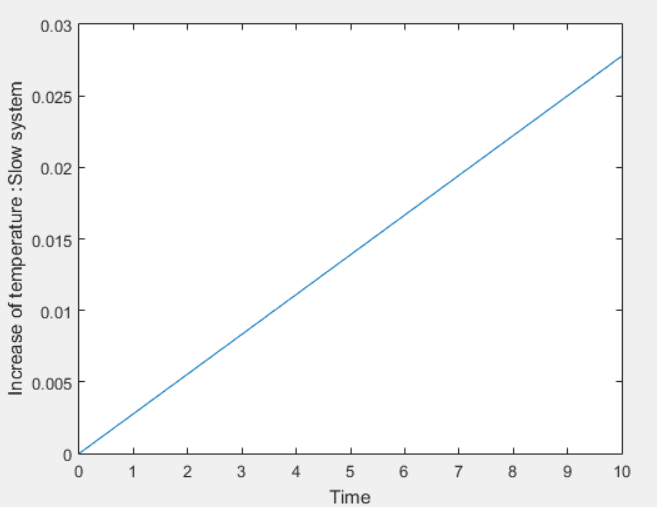
figure

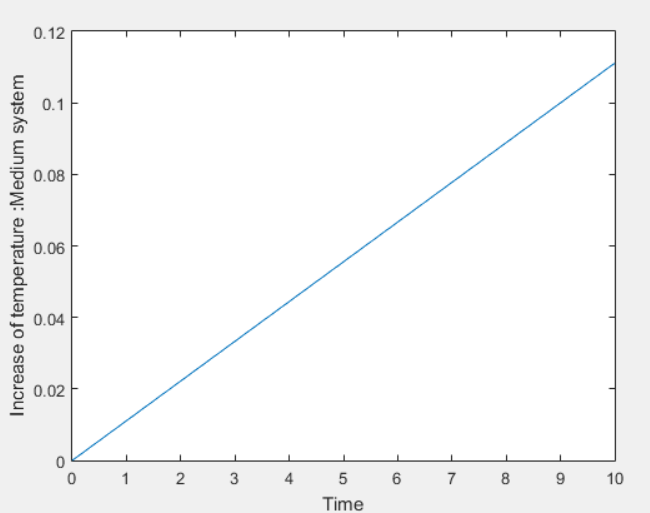
plot(x4,y4)

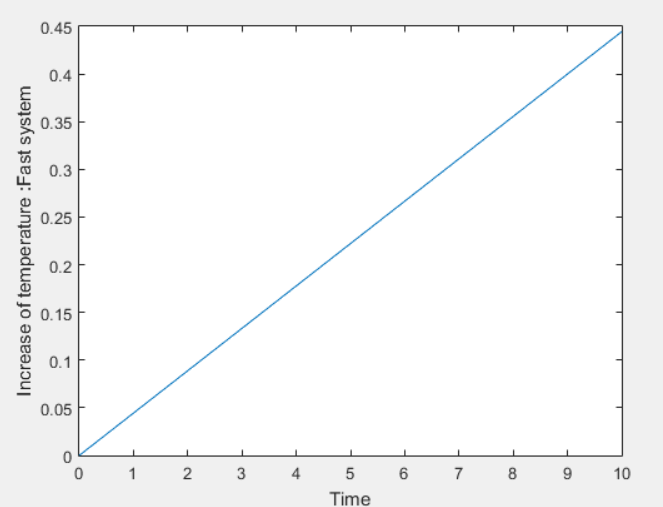
xlabel('Time')

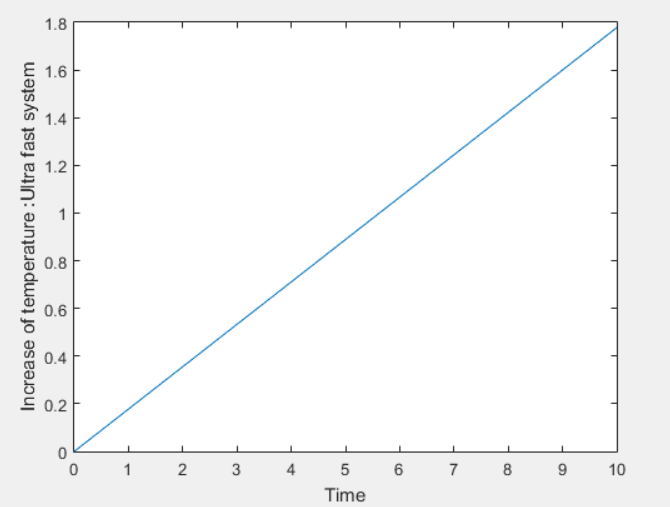
ylabel('Increase of temperature :Ultra fast system')

Outputs









**Part B. Evaluation of the impact of changing the enclosure material**

**B1**

**Matlab code**

T = 600;

t=1.05 %Thermal conductivity of glass

alpha1=0.002778; %Define cofficient alpha for slow medium

alpha2=0.011111; %Define cofficient alpha for medium medium

alpha3=0.044444; %Define cofficient alpha for fast medium

alpha4=0.177778; %Define cofficient alpha for ultra fast medium

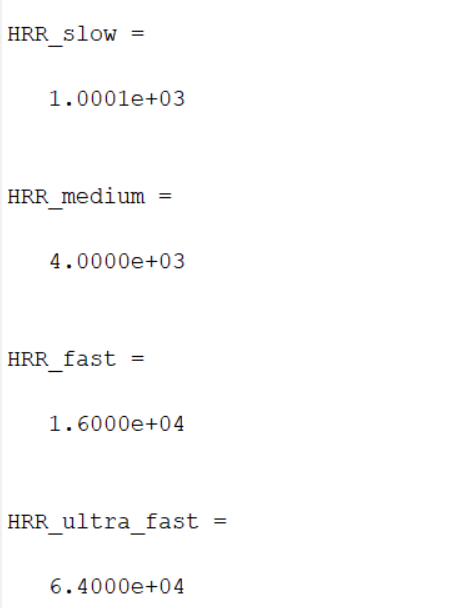
HRR\_slow=t\*alpha1\*T\*T

HRR\_medium=t\*alpha2\*T\*T

HRR\_fast=t\*alpha3\*T\*T

HRR\_ultra\_fast=t\*alpha4\*T\*T

Output



**B2**

**Matlab code**

T = 600;

t=1.05 %Thermal conductivity of glass

alpha1=0.002778; %Define cofficient alpha for slow medium

alpha2=0.011111; %Define cofficient alpha for medium medium

alpha3=0.044444; %Define cofficient alpha for fast medium

alpha4=0.177778; %Define cofficient alpha for ultra fast medium

HRR\_slow=t\*alpha1\*T\*T

HRR\_medium=t\*alpha2\*T\*T

HRR\_fast=t\*alpha3\*T\*T

HRR\_ultra\_fast=t\*alpha4\*T\*T

x1 = linspace(0,10,150);

y1 = t\*alpha1\*x1;

figure

plot(x1,y1)

xlabel('Time')

ylabel('Increase of temperature :Slow system')

x2 = linspace(0,10,150);

y2 = t\*alpha2\*x2;

figure

plot(x2,y2)

xlabel('Time')

ylabel('Increase of temperature :Medium system')

x3 = linspace(0,10,150);

y3 = t\*alpha3\*x3;

figure

plot(x3,y3)

xlabel('Time')

ylabel('Increase of temperature :Fast system')

x4 = linspace(0,10,150);

y4= t\*alpha4\*x4;

figure

plot(x4,y4)

xlabel('Time')

ylabel('Increase of temperature :Ultra fast system')

Outputs

