NAME: SHAILJA KANT TIWARI

COURSE:B.SC(H)PHYSICS,SEM-6

ROLL NO:081

SOURCE CODE:

**clc**

**clear**

**clf**

**k=1.38e-23**

**N=6e23**

**pi=3.14**

**v=linspace(0,2000,2000)**

**T=300:300:900**

**M=input("Enter mpolar mass:")**

**m=M/(N\*1000)**

**for j=1:length(T)**

**a=4\*3.14\*(v.^2)\*((m/(2\*3.14\*k\*T(j)))^1.5)**

**fv=a.\*exp((-m/(2\*k\*T(j))).\*(v.^2))**

**plot2d(v',fv,j)**

**a=gca()**

**a.box="on"**

**b=a.children.children**

**b.thickness=3**

**legend('T='+string(T)+'K')**

**xlabel('v(m/s)','fontsize',5)**

**ylabel('f(v)','fontsize',5)**

**title("Maxwell Boltzmann Distribution of velocities ","fontsize",5)**

**function avg=f(v)**

**avg=v\*(4\*pi)\*(m/(2\*k\*T(j))/pi)^1.5\*(v^2)\*exp(-m/(2\*k\*T(j))\*(v^2))**

**endfunction**

**vavg(j)=intg(0,1e4,f)**

**aavg(j)=sqrt(8\*k\*T(j)/(3.14\*m))**

**function rms=g(v)**

**rms=(v^2)\*(4\*pi)\*(m/(2\*k\*T(j))/pi)^1.5\*(v^2)\*exp(-m/(2\*k\*T(j))\*(v^2))**

**endfunction**

**vrms(j)=sqrt(intg(0,1e4,g))**

**arms(j)=sqrt(3\*k\*T(j)/m)**

**[q,p]=max(fv)**

**vmp(j)=v(p)**

**end**

**for j=1:length(T)**

**disp("For temperature="+string(T(j))+"K")**

**disp("Avg speed from curve is="+string(vavg(j))+"m/s")**

**disp("Actual avg speed is="+string(aavg(j))+"m/s")**

**disp("RMS speed frm curve is="+string(vrms(j))+"m/s")**

**disp("Actual RmS speed is="+string(arms(j))+"m/s")**

**disp("Most Probable speed is="+string(vmp(j))+"m/s")**

**end**

OUTPUT:

Enter molar mass:32

For temperature=300K

Avg speed from curve is=444.71418m/s

Actual avg speed is=444.71418m/s

RMS speed frm curve is=482.63242m/s

Actual RmS speed is=482.57124m/s

Most Probable speed is=394.1971m/s

For temperature=600K

Avg speed from curve is=628.92082m/s

Actual avg speed is=628.92082m/s

RMS speed frm curve is=682.54531m/s

Actual RmS speed is=682.45879m/s

Most Probable speed is=557.27864m/s

For temperature=900K

Avg speed from curve is=770.26755m/s

Actual avg speed is=770.26755m/s

RMS speed frm curve is=835.94387m/s

Actual RmS speed is=835.8379m/s

Most Probable speed is=682.34117m/s

