

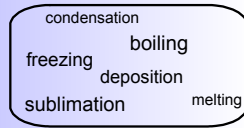
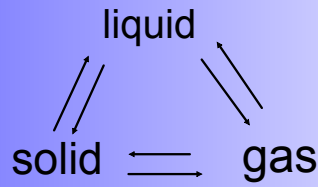
States of Matter

What external factors affect whether something is a solid, liquid or a gas?

External Factors that affect state of matter:

1. Temperature
2. Pressure

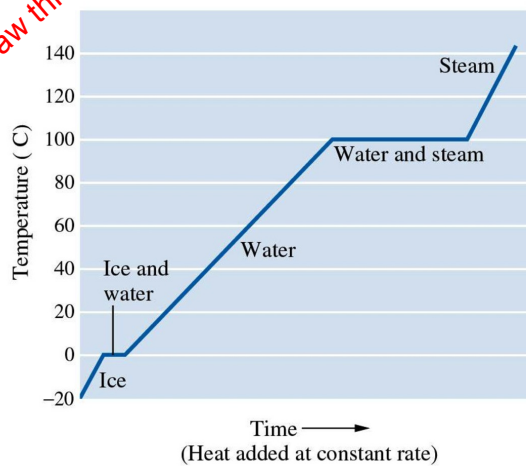
Phase changes



temperature:

Figure 11.9: Heating curve for water.

Draw this!



Where are melting and freezing occurring?

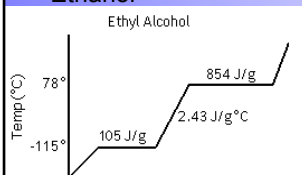
where the lines are horizontal
(at 0°C and 100°C)

Why is the line horizontal at these points?

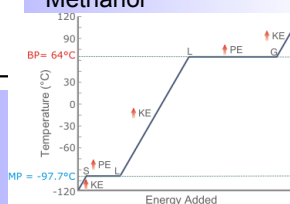
It takes more energy to break the bonds that hold water together
temperature does not increase during melting and freezing

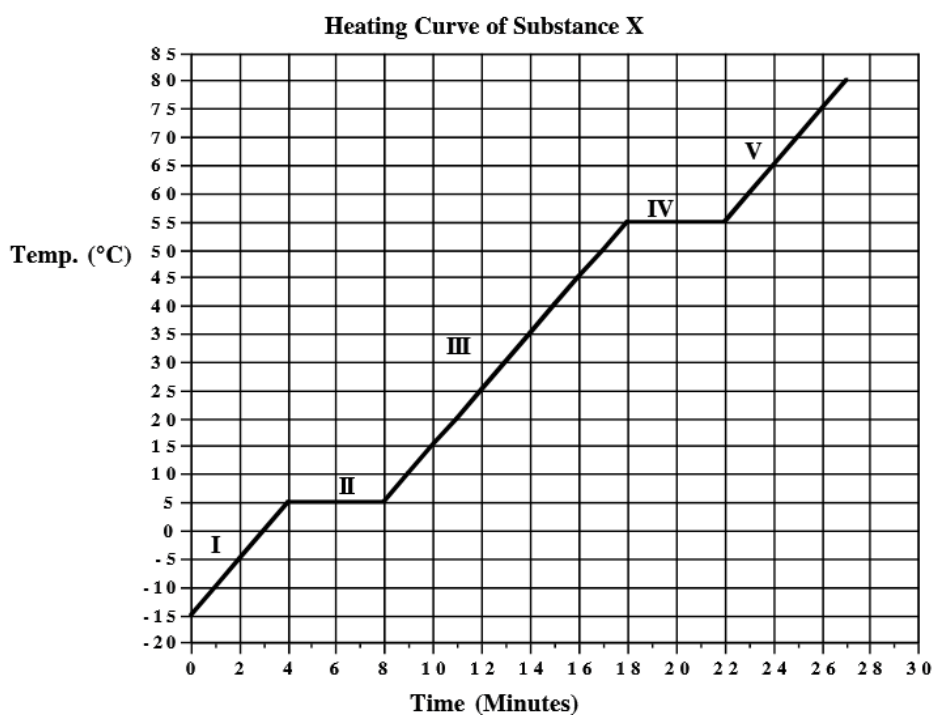
Other substances:

Ethanol



Methanol



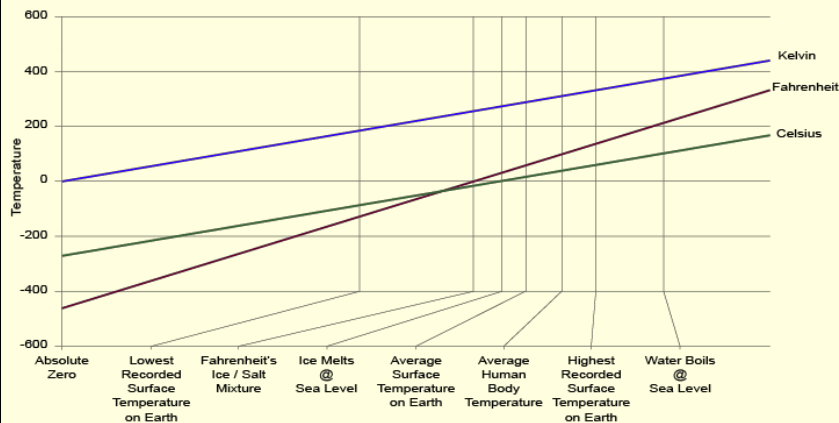
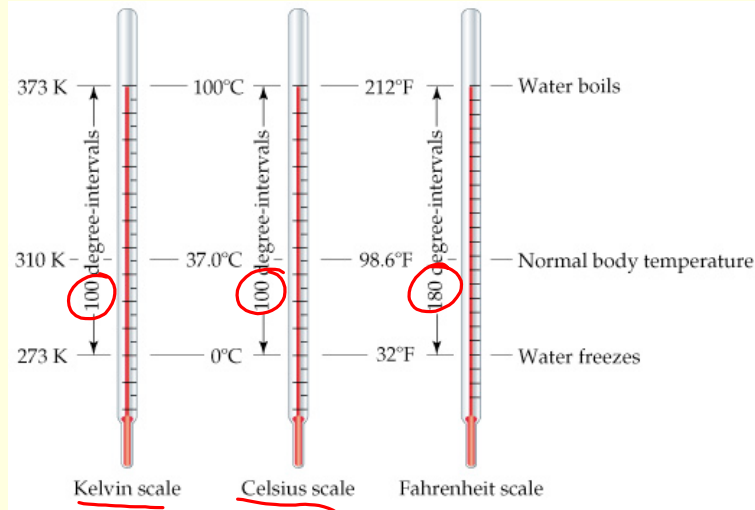
CHEMISTRY**HEATING CURVE WORKSHEET**

The heating curve shown above is a plot of temperature vs time. It represents the heating of substance X at a constant rate of heat transfer. Answer the following questions using this heating curve:

- _____ 1. In what part of the curve would substance X have a definite shape and definite volume?
- _____ 2. In what part of the curve would substance X have a definite volume but no definite shape?
- _____ 3. In what part of the curve would substance X have no definite shape or volume?
- _____ 4. What part of the curve represents a mixed solid/liquid phase of substance X?
- _____ 5. What part of the curve represents a mixed liquid/vapor phase of substance X?
- _____ 6. What is the melting temperature of substance X?
- _____ 7. What is the boiling temperature of substance X?

Comparing Temperature Scales

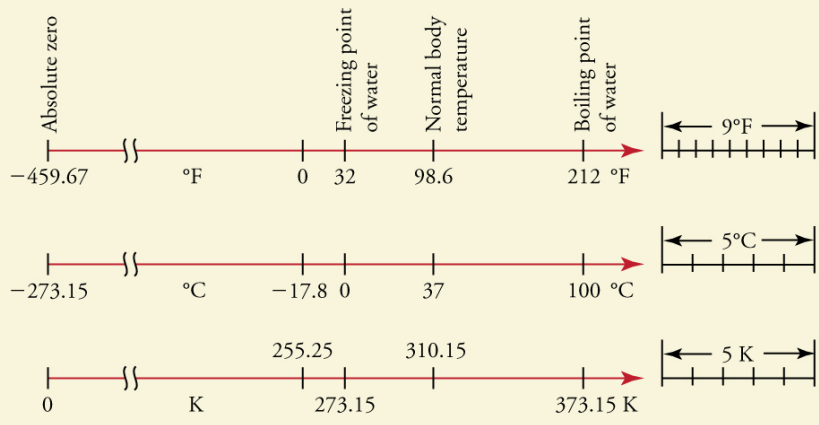
^oFahrenheit
^oCelcius (centigrade)
 Kelvin



slope of K = slope of ^oC

273^o difference

$$K = ^\circ C + 273.15$$



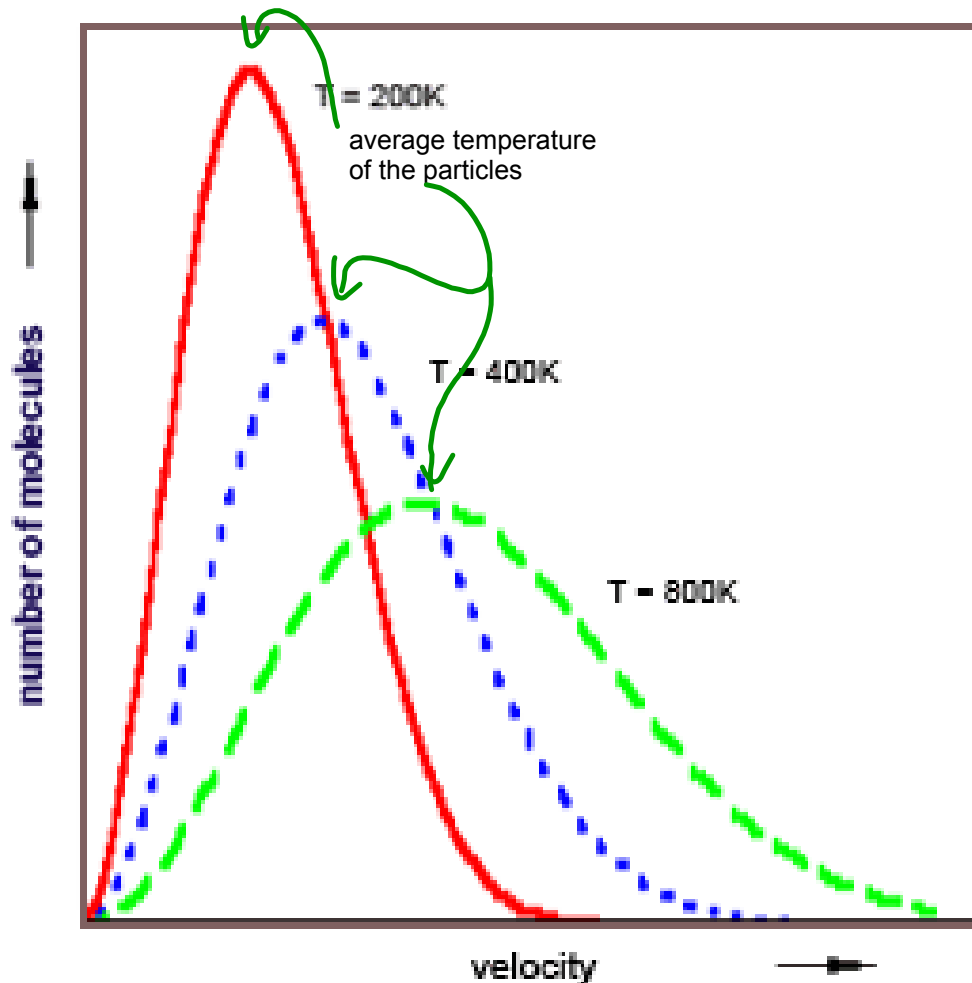
$$^\circ C = (^\circ F - 32) \times \frac{5}{9}$$

$$^\circ F = ^\circ C \times \frac{9}{5} + 32$$

Temperature

is the measure of velocity of the particles

Maxwell-Boltzmann distribution of velocities



KE is dependent on speed of particles

$$KE = \frac{1}{2} mv^2$$

In any particular mixture of moving molecules, the speed will vary a great deal, from very slow particles (low energy) to very fast particles (high energy). Most of the particles however will be moving at a speed very close to the average. The Maxwell-Boltzmann distribution shows how the speeds (and hence the energies) of a mixture of moving particles varies at a particular temperature.

Attachments

temperature-convert.webloc