PRESSURE UNITS

1 atm = 760 mmHg = 760 torr = 101.3 kPa = 14.7 psi

Background:

Pressure is defined as Force / Area such as pounds per square inch (psi).

The weight of air pushing down per square inch is 14.7 pounds per square inch or **14.7 psi.**

A barometer can be used to measure pressure. A column of mercury (Hg) that is 0.760 meter (760 mm) tall has the same weight as a column of air from sea level to the edge of the stratosphere. The height of this column is a good measure of air pressure... **760 mmHg.**

Evangelista Torricelli did a lot of experiments with pressure and so 1 mmHg is also called 1 torr. So, air pressure has a value of **760 torr.** This amount of pressure is also called **1 atm** (one atmosphere) because it IS the atmosphere.

In metric units, pressure if Newtons (force) per square meter (area). One Newton is not very much pressure... about the weight of a small apple (get it... apple... Newton)... and if that force is exerted over a square meter, the amount of pressure is very small and called a pascal (Pa). It is more useful to talk of kilopascals (kPa) which would be the weight of 1000 small apples exerted over a square meter. Air pressure is equal to **101.3 kPa.**

Since each of these values (see the top of the page) represent the same amount of pressure, any two of them can be used as a conversion factor. You can convert one pressure unit into another.

Example:

What is 515 mmHg in kPa? $515 \text{ mmHg} \times \frac{101.3 kPa}{760 mmHg} = 68.6440789 \text{ kPa} = 68.4 \text{ kPa}$

Problems:

1. 745 mmHg into psi
2. 727 mmHg into kPa
3. 52.5 kPa into atm
4. 0.729 atm into mmHg
5. 522 torr into kPa
6. 1.10 atm into psi
7. 800. mmHg into atm
8. 125 kPa into torr

Chem

CH 13 TERMS

Kinetic Energy

Kinetic Theory

mm Hg
Pa
kPa
Atm

Atmospheric Pressure

Average Kinetic Energy / Kelvin Temp

Vaporization → Evaporation

Vapor Pressure
↓
Constant Vapor Pressure

bp - Boiling Point → bp and Pressure Changes

normal boiling point

mp - Melting Point

crystal

7 groups or systems
&
unit cells (1 to 4 types for each system)

Cubic crystal system
↓
unit cells
/ | \
simple cubic | Body centered | Face centered

Allotropes
↓
carbon - diamond, graphite, fullerene
↓
P, S, O, B, Sb

Amorphous Solids
↓
rubber, plastic, asphalt, GLASS

SUBLIMATION

Phase Diagrams
↓
the conditions of pressure and temperature at which 2 phases exist in equilibrium are indicated on a phase diagram by a line separating the phases

Triple Point - set of conditions at which all 3 phases exist in equilibrium