Ideal Gas and Kinetic of Gases
TL;DRs

An OS Creation of Shazin

Gas Laws:

Boyle's Law:

*"If **Temperature** is constant , the **volume** of a gas with a specific mass is disproportional to the **pressure** applied to the gas."*

Mathematical interpretation: $P_1V_1=P_2V_2$

Charles's Law:

*" In a constant **pressure** the **volume** of a gas is proportional to it's **temperature.**"*

Mathematical implementation: $\frac{V_1}{T_1}=\frac{V_2}{T_2}$

Gay-Lussac's Law:

*"In a constant **volume and mass** pressure increases in a proportional rate to temperature"*

Mathematical implementation: $\frac{P_1}{T_1}=\frac{P_2}{T_2}$

Avogadro's Law:

*" In a constant **pressure** and **temperature** the **volume** is directly proportional to the **number of moles** of the gas"*

Mathematical implementation: $\frac{V_1}{n_1}=\frac{V_2}{n_2}$

Graham's Law (Law for Diffusion Rate):

*" Diffusion rate is inversely proportional (**disproportional**) to the square root of it's **molar mass**"*

Mathematical implementation: $\frac{t_2}{t_1}=\frac{r_1}{r_2}=\sqrt{\frac{m_2}{m_1}}$

***Note: The molar mass is actually the mass of an atom. It means it is the mass given in the periodic table not the mass of of the sample.*

Combined Gas Law: $\frac{P_1V_1}{T_1}=\frac{P_2V_2}{T_2}$

Equation of density of a Gas: $\rho_1T_1=\rho_2T_2$

Ideal Gas Equation:

$$PV = nRT$$

Here, P = Pressure ; V = Volume ; n = Number of Moles ; T = Temperature ; **R = Ideal Gas Constant = 8.314 JK^{-1} $mole^{-1}$** ;

Pressure of Fluid:

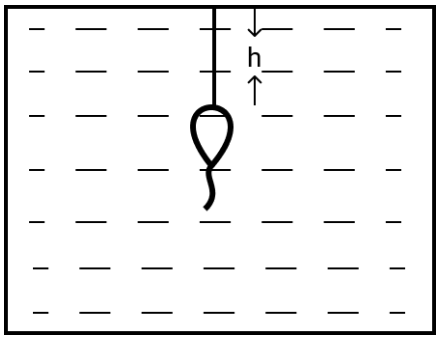
The pressure effective in an object drowned in a fluid is, $P = h\rho g$

Here, h = height of the fluid, ρ = density of the fluid and g = gravitational acceleration.

Tips for Math related to Pressure in Fluid:

Tip:1 *If the the pressure of atmosphere is given P_1 then the pressure in the fluid P_2 should be*

$$P_2 = P_1 + h\rho g$$



Tip:2 *If The pressure of a balloon in air is P_1 , it's pressure when drowning in a fluid should be*

$$P_2 = P_1 + h\rho g$$