Mathematical Relationships and Properties of Gases

- The physical properties which will chiefly be concerned with are:
  - n = quantity or amount of a gas measured in moles.
  - P = pressure of the gas sample, measured in Pascals (Pa) or kiloPascals (kPa)
  - V = volume of the gas sample, measured in Litres (L) or m^3
  - T = temperature of the gas sample, measured in Kelvins ($T_K = T^oC + 273$)

Charles Law

- the volume of a fixed quantity of gas kept at constant pressure is directly proportional to the Kelvin temperature.

$$V_1/T_1=V_2/T_2$$

Boyle's Law

- The volume of a fixed mass of a gas at constant temperature varies inversely as the applied pressure.

$$P_1V_1= P_2V_2$$

Combined Gas Laws

$$P_1 \times V_1/ T_1=P_2 \times V_2/ T_2$$

The Ideal Gas Law

$$P V = n R T$$