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A General Equation from Charls Law

Charles and Gay Lussac

0 °C = 273.15K =Kelvin temperature scale or Absolute temperature scale or Thermodynamic scale

If we write $T_t = 273.15 + t$ and $T_0 = 273.15$

$$V_t = V_0 \left(\frac{T_t}{T_0} \right)$$

$$\Rightarrow \frac{V_t}{V_0} = \frac{T_t}{T_0} \qquad (5.7)$$

General Equation

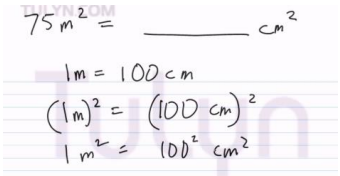
t = 2 and 0=1

$$\frac{V_2}{V_1} = \frac{T_2}{T_1} \qquad (5.8)$$

$$\Rightarrow \frac{V_1}{T_1} = \frac{V_2}{T_2}$$

$$\Rightarrow \frac{V}{T} = \text{constant} = k_2 \qquad (5.9)$$

$$\text{Thus } V = k_2 T \qquad (5.10)$$



The value of constant k_2 is determined by the pressure of the gas, its amount and the units in which volume V is expressed

cgs units = cm^3 = 1ml = 1cc

The base unit of volume in the SI system is the liter. There are 1000 liters per cubic meter, or 1 liter contains the same volume as a cube with sides of length 10cm

SI units = lxbxh=1mx1mx1m=$1m^3$

$1m^3$ = 1000L Threfore .. $1/10^3$ x m^3 = 1L

Threfore SI Unit of Volume=10^{-3} x m^3