Physics Formulas

Wei Meng Soh *

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Abstract
This is a list of formulas for physics.

1 Thermometry

Type of thermometers

Liquid thermometer

Thermometric Property: $\Delta V \propto \Delta\theta$
Formulae:

$$\theta = \frac{\ell_\theta - \ell_0}{\ell_{100} - \ell_0} \times 100°\text{C} \quad , \quad T = \frac{\ell_T - \ell_{00}}{\ell_{tr} - \ell_{00}} \times 273.16 \text{ K}$$

Gas thermometer

Thermometric Property: $\Delta P \Delta V \propto \Delta\theta$ (where $P = \rho g h$)
Formulae:

$$\theta = \frac{P_\theta V_\theta - P_0 V_0}{P_{100} V_{100} - P_0 V_0} \times 100°\text{C} \quad , \quad T = \frac{P_T V_T}{P_{tr} V_{tr}} \times 273.16 \text{ K}$$

Resistance thermometer

Thermometric Property: $\Delta R \propto \Delta\theta$ (where (i)$R = \frac{P}{Q} \times S$ (ii) $R_t = R_0(1 + at + bt^2)$)
Formulae:

$$\theta = \frac{R_\theta - R_0}{R_{100} - R_0} \times 100°\text{C} \quad , \quad T = \frac{R_T}{R_{tr}} \times 273.16 \text{ K}$$

Thermoelectric thermometer

Thermometric Property: $\Delta\varepsilon \propto \Delta\theta$
Formulae:

$$\theta = \frac{\varepsilon_\theta - \varepsilon_0}{\varepsilon_{100} - \varepsilon_0} \times 100°\text{C} \quad , \quad T = \frac{\varepsilon_T - \varepsilon_{00}}{\varepsilon_{tr} - \varepsilon_{00}} \times 273.16 \text{ K}$$

*Chong Hwa Independent High School Kuala Lumpur