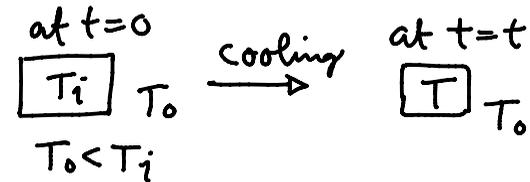


Class XI, Thermal Radiation

Thursday, December 16, 2021 7:53 PM

NEWTON'S LAW OF COOLING



"Rate of cooling of a hot body is directly proportional to the temperature difference between the body and its surrounding, provided this difference in temp. is small."

$$-\frac{dQ}{dt} \propto (T - T_0)$$

$$\text{or } -\frac{dQ}{dt} = k(T - T_0) \Rightarrow \frac{dQ}{dt} = -k(T - T_0) \text{---(1)}$$

$$\therefore dQ = ms dT, \text{ by Eq. (1)}$$

$$ms \frac{dT}{dt} = -k(T - T_0) \text{---(2)}$$

$\left. \begin{array}{l} \frac{dT}{dt} = \text{rate of} \\ \text{change of Temp} \\ \text{of the body.} \end{array} \right\}$