



Q.04

p-V diagrams of same mass of a gas at two different temperatures T_1 and T_2 . Explain whether $T_1 > T_2$ or $T_2 > T_1$.

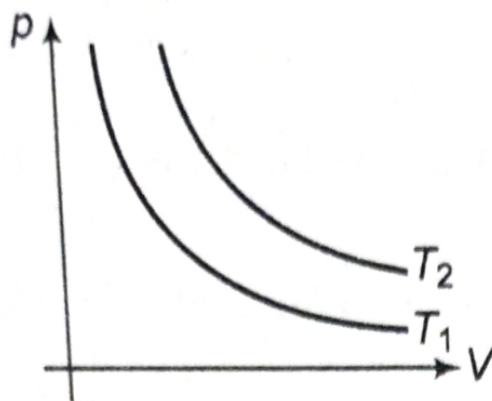


Fig. 20.18

Solution The ideal gas equation is

$$pV = nRT \quad \text{or} \quad T = \frac{pV}{nR}$$

$T \propto pV$ if number of moles of the gas are kept constant. Here n and R are constant, which implies that number of moles are constant, i.e. $T \propto pV$. In the diagram, the curve for T_2 is more than T_1 at all points (keeping either p or V same).

$$T_2 > T_1$$