Answer on question #58116, Physics / Molecular Physics — Thermodynamics —

Question 8. If the volume of a gas is 500cm3 at 127 C and 380mm of mercury, calculate the volume of this gas at s.t.p
115cm3
128.7cm3
149.2cm3
170.6cm3

9. The mechanism of heat transfer from one point to another through vibration of the molecules of the medium is called ————- convection
conduction
radiation
diffusion

Solution 8. We can easily find number of moles of gas from equation

$$pV = \nu RT$$

where $V = 5 \cdot 10^{-4}$ m^3, $T = 273 + 127 = 400$ K, $p = 50662.5$ Pa, $R = 8.31$.

$$\nu = \frac{pV}{RT} = \frac{50662.5 \cdot 5 \cdot 10^{-4}}{8.31 \cdot 400} \approx 0.00762\, moles$$

So, its volume at s.t.p is

$$V = \nu V_m = 0.00762 \cdot 22.4 = 0.1706\, dm^3 = 170.6\, cm^3$$

9. The mechanism of heat transfer from one point to another through vibration of the molecules of the medium is called conduction.