

2 Atoms, molecules and moles – Part 2 —Answers

Answers

Work through these after trying the questions yourself.

2.1 24.0 dm^3 .

2.2 $V = n \times 24 = 0.25 \times 24 = 6.0 \text{ dm}^3$.

2.3 moles C = $6.0/12 = 0.50$; ratio 1 : 1, so 0.50 mol CO_2 ; mass = $0.50 \times 44 = 22 \text{ g}$.

2.4 The reactant that runs out first; it decides how much product forms.

2.5 $n = cV = 0.200 \times (25.0/1000) = 5.00 \times 10^{-3} \text{ mol}$.

2.6 moles HCl = $0.100 \times (25.0/1000) = 2.50 \times 10^{-3}$; ratio 1 : 1, so same moles NaOH;
 $c = n/V = 2.50 \times 10^{-3} / (20.0/1000) = 0.125 \text{ mol dm}^{-3}$.

2.7 moles $\text{H}_2 = 4.0/2 = 2.0$; moles $\text{O}_2 = 16/32 = 0.50$. The equation needs 2 mol H_2 per 1 mol O_2 , so 0.50 mol O_2 needs only 1.0 mol H_2 . There is 2.0 mol H_2 (in excess), so O_2 is the limiting reagent.