

Molar Volume Use

Q1. (2018)

A)

Question Number	Answer	Mark
7(a)	B 750 The only correct answer is B A is not correct because 375.5 dm³ is half the actual volume formed C is not correct because 1125.5 dm³ is one and a half times the actual volume formed D is not correct because 1500 dm³ is double the actual volume formed	(1) AO 2 1

B)

Question Number	Answer	Additional guidance	Mark
7(b)	$\frac{1}{2} \times 750$ (1) = 375 (dm ³)	375 alone (1)	(1) AO 2 1

C)

Question Number	Answer	Additional guidance	Mark
7(c)	final answer of 2 (kg) with or without working (3) OR moles of SO₂ = $\frac{750}{64}$ (1) (= 31.25) mass of SO₂ = $\frac{24}{64} \times 750$ (1) (= 2000) mass of SO₂ = $\frac{2000}{1000}$ (1) (= 2 (kg))	allow ECF throughout 31.25 x 64 (2) allow ECF allow any calculated mass / 1000 (1) final answer 2000 (kg) (2)	(3) AO 2 1

Q2. (2019) – 10b

Question number	Answer	Additional guidance	Mark
10(b)	2000 dm³ with or without working scores 4 moles NO = 1000/30 (1) (= 33.3...) moles O₂ = moles NO / 2 (1) (= 16.666...) volume O₂ = moles x 24 = 16.666... x 24 (1) (=400 dm³) volume air = volume O₂ x 100/20 (1) (=2000 dm³) OR 2 mol NO = 60 g (1) 60 g NO : 24 dm³ oxygen (1) 1000 g NO reacts with 24 x 1000/60 (1) (=400 dm³) volume air = volume O₂ x 100/20 (1) (=2000 dm³)	ecf on all stages 3 marks all working up to 400 x 20/100 = 80	(4)

Q3. (2020) – 7a (ii)

Question number	Answer	Additional guidance	Mark
7(a)(ii)	final answer of 2.4 with or without working (3) OR $\frac{0.4}{16} = 0.025$ (1) $0.025 \times 4 = 0.1$ (1) $0.1 \times 24 = 2.4$ (1)		(3)

Q4. (2022) – 10b, 10c

A)

Question number	Answer	Mark
10(b)	300 (dm ³)	(1) AO2-1

B)

Question number	Answer	Additional guidance	Mark
10(c)	1 mol C ₃ H ₈ produces 1 mol H ₂ (1) no moles propane = $\frac{900}{24}$ (1) (= 37.5) = no moles H ₂ mass of H ₂ = 37.5 x 2 g (1) (= 75.0 (g)) = 7.50 x 10 ⁻² (kg) (1) (= 0.075)	Answer of 0.075 with or without working scores full marks Allow ECF throughout allow 37.5 (moles) for 2 marks Allow 75.0 x 10 ⁻³ (kg) as a correct final answer 0.0375 scores 3 75(.0) scores 3	(4) AO2-1

Q5. (2023) – 10a (ii)

Question number	Answer	Additional Guidance	Mark
10(a)(ii)	61 000 / 60 923 cm ³ with or without working scores 4 - amount of sodium azide = 110/65 = 1.692... mol (1) - amount of nitrogen = 3/2 x 1.692 = 2.538... mol (1) - volume of nitrogen = 24 x 2.538 = 60.923... dm³ (1) - volume in cm³ = 60.923 x 1000 = 60923/ 61 000 cm³ (1)	allow ecf and correct rounding at each stage 110/130 does not score MP1 but 110/130 x 3 = 2.538 scores MP1 and MP2 130g NaN ₃ → 84g N ₂ then 110g NaN ₃ → 71g N ₂ scores MP1, then mark on MP3 for attempt at moles of nitrogen worked out using data in question x 24 MP4 for attempt at volume of nitrogen worked out using data in question x 1000 Allow 2 s.f. or more 30462 scores 3 40615 scores 3 40.615 scores 2 20308 scores 2 20.308 scores 1	AO2 1 (4)

Q6. (2024) – 10b

Question number	Answer	Additional guidance	Mark
10(b)	3250 (dm ³) with or without working scores 2 1 mole CH ₄ produces 5 moles products (1) 5 x 650 = 3250 (dm ³) (1)	allow 1x650 = 650 or 4x650 = 2600 for 1 mark.	(2) AO2-1

Q7. (2024) – 10c

Question number	Answer	Additional guidance	Mark
10(c)	825 (g) with or without working scores 3 no moles H₂ $\frac{1800}{24} = 75$ (1) no moles CO₂ $\frac{75}{4} = 18.75$ (1) mass of CO₂ $18.75 \times 44 \text{ g} = 825 \text{ (g)}$ (1)	allow ECF from incorrect answer but only if using 1800 and 24 allow ECF from an incorrect calculation of number of moles 450 with working gains 1 mark 3300 with working gains 2 marks 13200 with working gains 2 marks	(3) AO2-1