

(Moles (and Avogadro's constant))

Q1. (2020)

The energy needed for a car powered by a hydrogen fuel cell to travel 100 km is 58 megajoules (MJ).

The energy released when 1 mole of hydrogen gas reacts with oxygen is 290 kJ

The volume of 1 mole of a gas at room temperature and pressure is 24 dm³

Calculate the volume of hydrogen gas at room temperature and pressure needed for the car to travel 100 km

[4 marks]

Volume of hydrogen gas = _____ dm³

Q2. (2022)

Calculate the number of C_{70} molecules that can be made from one mole of carbon atoms.

The Avogadro constant = 6.02×10^{23} per mole

[3 marks]

Number of molecules = _____

Q3. (2023)

Which expression shows how to calculate the mass of carbon needed to produce 1 mole of iron from iron oxide?

Relative atomic mass (A_r): C = 12

[1 mark]

Tick (✓) **one** box.

$$\frac{1}{3} \times 12 \text{ g}$$

☐

$$\frac{3}{2} \times 12 \text{ g}$$

☐

$$1 \times 12 \text{ g}$$

☐

$$3 \times 12 \text{ g}$$

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