

Question 26 (4 marks)

A gas is produced when 10.0 g of zinc is placed in 0.50 L of 0.20 mol L⁻¹ nitric acid.

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Calculate the volume of gas produced at 25°C and 100 kPa. Include a balanced chemical equation in your answer.

$$\begin{aligned} \frac{\text{no. of moles}}{M} &= \frac{10.0 \text{ g}}{65.41} \\ &= 0.15288 \text{ mol L}^{-1} \end{aligned}$$

$$\begin{aligned} \text{Volume} &= C \times n \\ &= 0.50 \times 0.15288 \\ &= 7.6 \times 10^{-2} \\ &= 0.038 \times 24.79 \\ &= 0.9476 \text{ g gas produced} \end{aligned}$$

$$\text{Zn} + \text{N}_3 \rightarrow \text{Zn}(\text{N}_3)$$