

2024 Ch H1 Q3

Section: Chemistry in Society

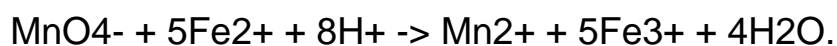
Topic: Oxidising and Reducing Agents

Question Summary:

Calculate the number of moles of Fe^{2+} required to react with 100 cm³ of 0.5 mol l⁻¹ KMnO_4 solution, using the balanced ionic redox equation.

Worked Solution

Balanced ionic equation:



Mole ratio $\text{Fe}^{2+} : \text{MnO}_4^- = 5 : 1$.

Volume $\text{KMnO}_4 = 100 \text{ cm}^3 = 0.100 \text{ L}$.

Moles $\text{MnO}_4^- = 0.5 \times 0.100 = 0.05 \text{ mol}$.

Moles $\text{Fe}^{2+} = 5 \times 0.05 = 0.25 \text{ mol}$.

Final Answer:

0.25 mol Fe^{2+} .

Revision Tips

- Always write the balanced ionic redox equation first.
- Convert cm³ to litres before using $n = c \times v$.
- MnO_4^- is a common oxidising agent; Fe^{2+} is a common reducing agent.