- What mass of calcium chloride is required to make 250 mL of a 0.1 M solution?

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The formula mass of calcium chloride, $CaCl_2$, is

formula mass = 40.08 (Ca) + 2 × 35.45 (Cl) = 110.98

The number of moles in the solution is given by:

number of moles = concentration × volume = $0.1 \times \dfrac{250}{1000} = 0.025$ mol

The mass required is therefore:

mass = number of moles × formula mass = (0.025) × (110.98) = 3 g

Answer: **3 g**

What amount of chloride ions (in mol) is present in 30.0 mL of this solution?

One moles of $CaCl_2$(s) dissolves to give two moles of Cl^-(aq) ions. Therefore, the number of moles present is:

number of moles = concentration × volume = $(2 \times 0.1) \times \dfrac{30}{1000} = 0.006$ mol

Answer: **0.006 mol**