

Titration Calculation Worked Example

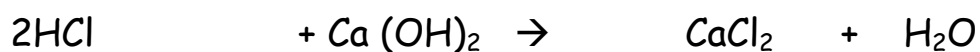
Using the formula from the data book method

What is the concentration of hydrochloric acid if 12.6 cm³ neutralises 20 cm³ of calcium hydroxide (concentration 0.2 mol l⁻¹)

$$\frac{C_1 V_1}{n_1} = \frac{C_2 V_2}{n_2}$$

1. Write the balanced equation

Hydrochloric + Calcium → calcium + water
Acid oxide chloride



2. Sub in numbers into the formula

$$\frac{C? \times 12.6}{2} = \frac{0.2 \times 20}{1}$$

3. Do the maths

$$C? \times 6.3 = 4$$

$$C = 4 / 6.3$$

$$= 0.63 \text{ mol l}^{-1}$$

Using the scholar method

What is the concentration of hydrochloric acid if 12.6 cm³ neutralises 20 cm³ of calcium hydroxide (concentration 0.2 mol l⁻¹)

1. Write the balanced equation

Hydrochloric + Calcium → calcium + water
Acid oxide chloride

2HCl + Ca (OH)₂ → CaCl₂ + H₂O

2. Write the mole ratio

2HCl : Ca (OH)₂
2 : 1

3. Gather info from the question

2HCl : Ca (OH)₂
2 : 1

C ? C = 0.2

V = 12.6 cm³ C = 20 cm³

 = **0.0126 litres** = 0.02 litres

4. Calculate number of moles OF Ca (OH)₂

$$\text{Moles} = C \times V = 0.2 \times 0.02 = 0.004 \text{ mol}$$

5 Apply the mole ratio 2 : 1

Moles of HCl = 2 × 0.004 = **0.008 mol**

6. Calculate concentration of HCl concentration = moles / volume

$$= 0.008 / 0.0126 = \mathbf{0.63 \text{ mol l}^{-1}}$$

