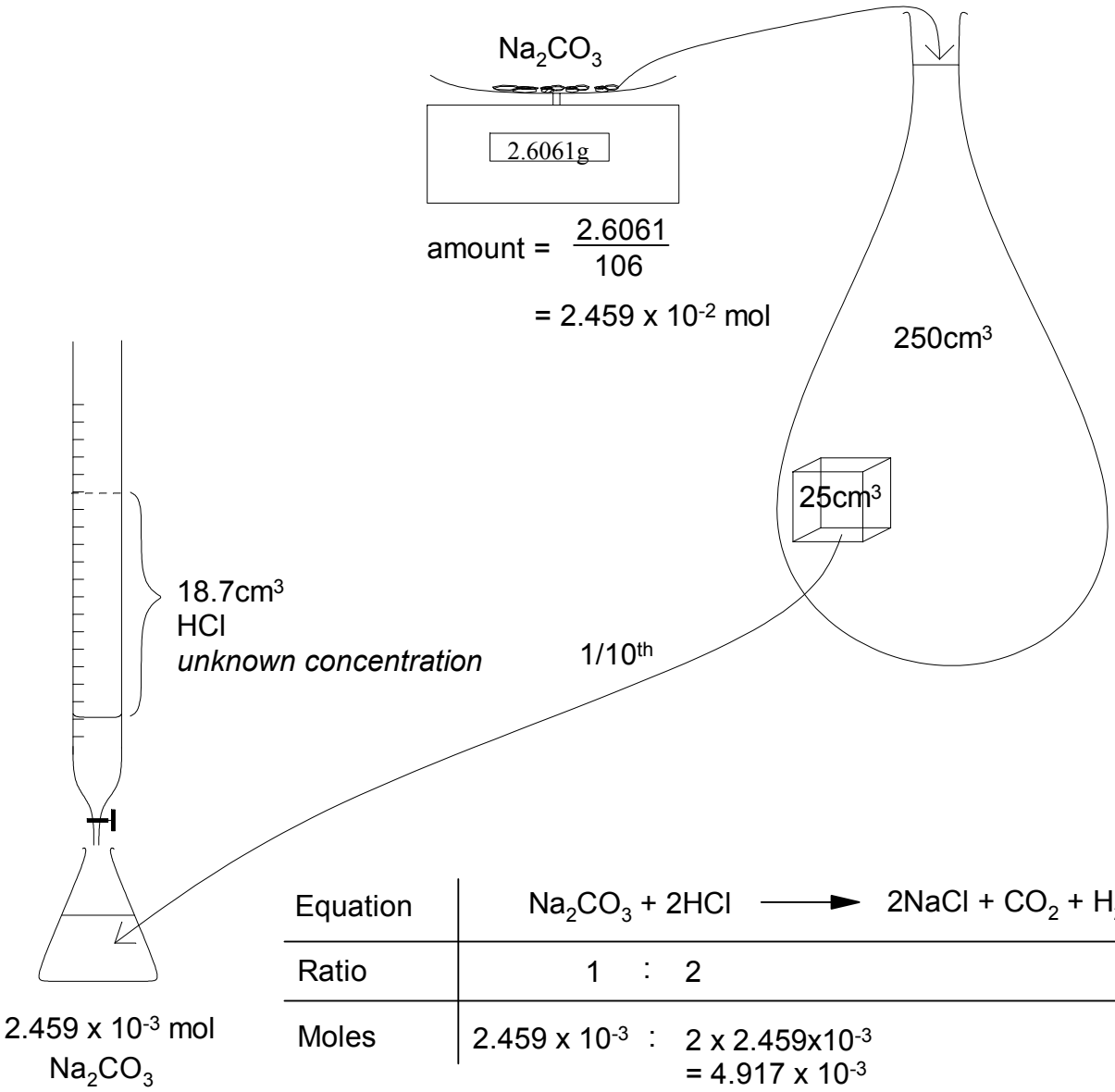
Sodium carbonate and hydrochloric acid

A standard solution was prepared by dissolving 2.6061g of anhydrous sodium carbonate in distilled water and making up to 250cm^3. A 25.0cm^3 portion of this solution was titrated against hydrochloric acid, using methyl orange as indicator. This indicator changes colour when sodium carbonate has been converted into sodium chloride. 18.7cm^3 of the acid were required for neutralisation. What is the concentration of the acid?

RMM (Na_2CO_3) = 106 gmol^{-1}



amount = $\frac{2.6061}{106}$

= 2.459×10^{-2} mol

Equation	$Na_2CO_3 + 2HCl \longrightarrow 2NaCl + CO_2 + H_2O$
Ratio	1 : 2
Moles	2.459×10^{-3} : $2 \times 2.459 \times 10^{-3} = 4.917 \times 10^{-3}$

concentration = moles / volume

HCl

$= \frac{4.917 \times 10^{-3}}{(18.7 / 1000)}$

$= 0.263$ moldm^{-3}