

YOU TRY- PRACTICE FOR LAB # 2

A student performed an acid base titration to determine the concentration of an HCl solution. In their conical flask they carefully pipetted 25ml of HCl. They then filled their burette with 0.116M NaOH.

They performed three titrations, stopping when the indicator changed colour. The volumes from the burette readings were 23.15ml 23.32ml and 23.25ml. What was the concentration of their HCl solution?

TITRATION CALCULATIONS

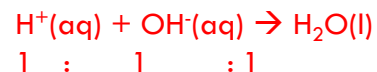
The **NaOH** was the known concentration solution in this case. It was placed in the burette, thus we need to determine the average titre volume

$$V(\text{NaOH}) = (23.15 + 23.32 + 23.25)/3 = 23.24\text{mL} = \underline{0.02324\text{L}}$$

The moles of NaOH therefore can be determined from $n=cV$

$$n = 0.116 \times 0.02324 \\ = \underline{0.002696 \text{ mols}}$$

Reaction:



$$\text{Thus: } n_{\text{HCl}} = n_{\text{NaOH}} = \underline{0.002696 \text{ mols}}$$

This is the part mistakes are often made : the volume of HCl was from the **pipette not the burette!**

$$V_{\text{HCl}} = 25\text{mL} = 0.025\text{L}$$

Therefore $c = n/V$

$$c_{\text{HCl}} = 0.002696/0.025 \\ = \underline{0.108 \text{ mols/L}}$$

Volume of known solution required
(mean titre volume, in L)

$$n = c \times V$$

moles of known
solution (in mol)

mole ratio

moles of unknown
solution (in mol)

$$c = n/V$$

Concentration of
unknown solution

Remember that the volume of unknown solution is
not the same as your known solution!

