Edexcel International Chemistry A Level

CP3 - Titration to find the Concentration of a Solution of Hydrochloric Acid

Flashcards

What safety precautions should be taken when using titration to investigate the concentration of hydrochloric acid?

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- Wear eye protection.
- Phenolphthalein is toxic and flammable so avoid inhaling and keep away from flames.
- Hydrochloric acid is an irritant so avoid contact with skin.
- Fill the burette below eye level to avoid splashing acid into your face and eyes.
- Clear up spillages and broken glassware immediately.

What colour is phenolphthalein in an acid and an alkali?

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Acid - colourless

Alkali - pink

Why is a volumetric pipette used to measure the volume of alkali into the conical flask before a titration?

Why is a volumetric pipette used to measure the volume of alkali into the conical flask before a titration?

A volumetric pipette is more accurate than a measuring cylinder.

What is the end-point of a titration?

What is the end-point of a titration?

The first point at which the indicator changes colour permanently. The point of neutralisation.

Which results are used when calculating a mean titre?

Which results are used when calculating a mean titre?

Two concordant results (within 0.10 cm^3 of each other).

What is the rough titre?

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The rough titre is carried out at the start of the titration to gain an approximate idea of how much solution is required from the burette for neutralisation.

Why shouldn't the rough titre be used when calculating the mean titre?

Why shouldn't the rough titre be used when calculating the mean titre?

The rough titre is not accurate enough.

What degree of accuracy should all burette readings be given to?

What degree of accuracy should all burette readings be given to?

To the nearest 0.05 cm^3.

What degree of accuracy should the mean titre be given to?

What degree of accuracy should the mean titre be given to?

To the nearest 0.05 cm^3. It should match the accuracy of all the values used in the mean calculation.

Write a chemical equation for the reaction between sodium hydroxide and hydrochloric acid

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$$HCl(aq) + NaOH(aq) \rightarrow NaCl(aq) + H_2O(l)$$
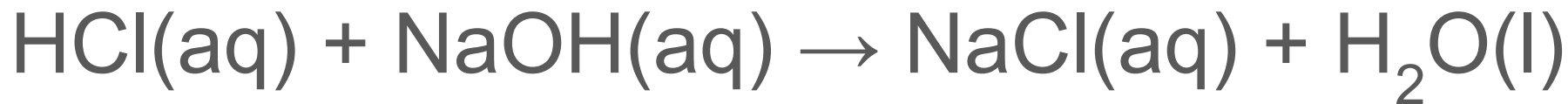
Describe how to conduct a titration between hydrochloric acid and sodium hydroxide to find the concentration of hydrochloric acid

Describe how to conduct a titration between hydrochloric acid and sodium hydroxide to find the concentration of hydrochloric acid

1. Use a pipette to add 25 cm^3 of diluted HCl to a conical flask. Add a few drops of phenolphthalein.
2. Pour sodium hydroxide into the burette. Record the initial burette volume.
3. Complete a rough titre. The conical flask should be swirled constantly above a white tile. Stop adding the sodium hydroxide as soon as the end point is reached.
4. Record the final burette volume and calculate the volume of sodium hydroxide solution added.
5. Repeat the titration until two concordant results are obtained.
6. Use the volume of sodium hydroxide to calculate the moles and concentration of hydrochloric acid, using the 1:1 reacting ratio.

Why is the conical flask swirled during a titration?

Why is the conical flask swirled during a titration?

To ensure all the reactants are combined so that the reaction is complete.

Why is it better to have a titre volume of 25 cm^3 than 10 cm^3?

Why is it better to have a titre volume of 25 cm^3 than 10 cm^3?

The larger the titre volume, the smaller the percentage error.

Why is a white tile used during a titration?

Why is a white tile used during a titration?

To make the colour change easier to observe.

Why might a solution be diluted before a titration?

Why might a solution be diluted before a titration?

To make the titre volume larger so that the percentage error is smaller.

What equation links number of moles and concentration?

What equation links number of moles and concentration?

Number of moles =

concentration (mol dm^{-3}) x volume (dm^3)

If you know the volume of acid required to neutralise an alkali, how could you calculate the concentration of the acid, given the alkali concentration and volume?

- Calculate the number of moles of the alkali using the known volume and concentration (n = C x V).
- Use the chemical equation to work out the ratio of acid and alkali that react and hence work out how many moles of acid have reacted.
- Divide the moles of acid by the volume used in neutralisation.