

Edexcel International Chemistry A Level

CP4 - Preparation of a Standard Solution and Titration

Flashcards

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Describe how to make a standard solution of sulfamic acid



Describe how to make a standard solution of sulfamic acid

1. Weigh an empty weighing boat. Add approximately 2.5 g of sulfamic acid and reweigh the weighing boat and contents.
2. Dissolve the sulfamic acid in about 100 cm³ of water in a beaker.
3. Transfer the solution into a 250 cm³ volumetric flask. Rinse the beaker with distilled water and add the washings to the flask.
4. Make the solution up to the 250 cm³ mark on the volumetric flask.



What method is used to weigh out the solid acid when making a standard solution of sulfamic acid?



What method is used to weigh out the solid acid when making a standard solution of sulfamic acid?

Weigh by difference method. The weighing boat is weighed with the solid acid and then again after it is transferred to the beaker in order to calculate if any solid is left in the weighing boat.



What safety precautions should be taken when titrating sodium hydroxide against sulfamic acid?



What safety precautions should be taken when titrating sodium hydroxide against sulfamic acid?

- Wear eye protection.
- Sulfamic acid is toxic if ingested so avoid putting it near your face and wash hands after use.
- 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 methyl orange in

- a) An acid?
- b) An alkali?
- c) A neutral solution?



What colour is methyl orange in a) An acid?
b) An alkali? c) A neutral solution?

a) Acid - red

b) Alkali - yellow

c) Neutral solution - orange



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



Why is a volumetric pipette used to measure the volume of acid 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



Which results are used when calculating a mean titre?



Which results are used when calculating a mean titre?

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



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



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

It 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?

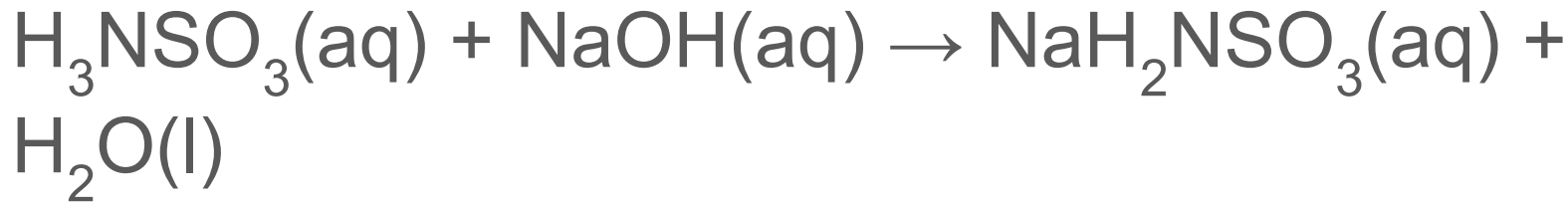
To the nearest 0.05cm^3



Sulfamic acid (H_3NSO_3) reacts with sodium hydroxide to form a salt and water. Write the chemical equation for this reaction



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



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

1. Use a pipette to add 25 cm^3 of $\text{NaOH}(\text{aq})$ to a conical flask. Add a few drops of methyl orange.
2. Pour the sulfamic acid solution into the burette. Record the initial burette volume.
3. Complete a trial titre. The conical flask should be swirled constantly above a white tile. Stop adding the acid as soon as the end point is reached. Record the final burette volume and calculate the volume of sodium hydroxide solution added.
4. Repeat the titration until two concordant results are obtained. Add the acid drop by drop near the end point.



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 x volume

$$n = C \times V$$



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



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

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



Why is only a small amount of indicator used during a titration?



Why is only a small amount of indicator used during a titration?

- Indicators are very dilute weak acids
- They (very slightly) change the volume of the solution in the conical flask and therefore its concentration

