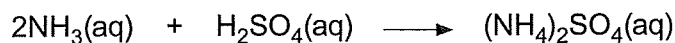


Unit 1 QER Examples

- (c) Ammonium sulfate can be prepared in the laboratory by neutralising aqueous sulfuric acid with ammonia solution in an acid-base titration.



Outline a method to obtain pure dry crystals of ammonium sulfate by this procedure.

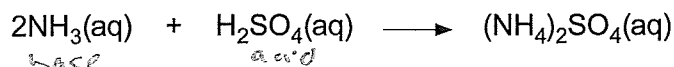
[6 QER]

~~Measure~~ Measure 25 cm^3 of ammonia solution into a volumetric flask and transfer, using a pipette, into a conical flask, 25 cm^3 . Place conical flask under a burette containing the acid and. ~~Add~~ Add an indicator (e.g. methyl orange) to ammonia solution to see when neutralisation occurs. Swirl the mixture when adding the acid. Once complete, ~~evaporate~~ transfer solution to an evaporating basin and evaporate off the water*. Leave to cool and ^{clear} crystals will have formed.

* until ~~sub~~ substance turns clear.



- (c) Ammonium sulfate can be prepared in the laboratory by neutralising aqueous sulfuric acid with ammonia solution in an acid-base titration.



Outline a method to obtain pure dry crystals of ammonium sulfate by this procedure.

[6 QER]

In the acid-base titration, sulfuric acid is the acid, and ammonia is the base.

Measure out 250cm^3 of sulfuric acid into a volumetric flask, pour into ~~the~~ a burette using a funnel, and fill up with water to the mark.

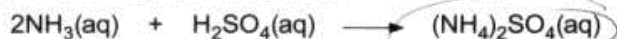
Measure out 25cm^3 of ammonia with a pipette and put into a volumetric flask. Add a few drops of ~~titrate~~ phenolphthalein indicator. Titrate the acid against the ammonia, swirling the flask as you do so. Add the acid dropwise to minimise errors. As soon as the indicator turns from pink to colourless, a neutral solution of ammonium sulfate has been obtained.

Crystals can be made from gently heating the solution to evaporate ~~to~~ excess liquid. Allow the solution to cool to allow crystals to form. Then filter off the crystals, wash with distilled water, and dry in a drying oven.

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- (c) Ammonium sulfate can be prepared in the laboratory by neutralising aqueous sulfuric acid with ammonia solution in an acid-base titration.



Outline a method to obtain pure dry crystals of ammonium sulfate by this procedure.

[6 QER]

Firstly, place the acid in the burette using a funnel, making sure the jet is filled. Remove funnel. Read volume of burette. Add 25 cm^3 (using a pipette) of NH_3 to a conical flask, adding a few drops of indicator. ^{the conical flask} Swirl. Place conical flask under white tile and run the acid into the conical flask until a colour change is seen. Record the volume of the acid on the burette. Repeat this method, again without the indicator to obtain the ~~pure~~ pure $(\text{NH}_4)_2\text{SO}_4$, using the volumes ^{accepted} from the initial titration. Heat the ~~solid~~ ammonium sulfate, then leave to dry. ^{Wash the crystals} ~~to a pure, as~~ ~~see~~ once the crystals have dried.

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