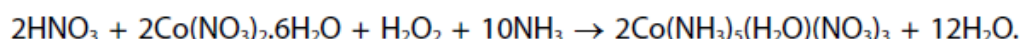


Unit 6 - activity

3 This question is about the preparation of a complex salt of cobalt(III).

The overall equation for the formation of this complex salt is:

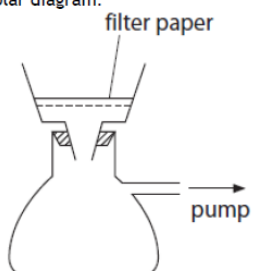


Procedure

- Step 1** Add 3.6 g of hydrated cobalt(II) nitrate, $\text{Co}(\text{NO}_3)_2 \cdot 6\text{H}_2\text{O}$, to 2.5 g of ammonium nitrate, NH_4NO_3 , in a large beaker.
- Step 2** Add just enough hot water to dissolve the two salts.
- Step 3** Keeping the beaker warm on a hot plate, add 40 cm^3 of aqueous ammonia.
- Step 4** Over a period of about 30 minutes, add a total volume of 25 cm^3 of 3.0% (3.0 g per 100 cm^3) hydrogen peroxide to the mixture. Allow the mixture to cool.
- Step 5** Carefully add 40 cm^3 of concentrated nitric acid to the mixture and leave to stand for a further 10 minutes.
- Step 6** To precipitate the complex salt, add cold ethanol to the mixture and filter the solid formed under reduced pressure.
- Step 7** Recrystallise the complex salt.

(c) Draw a labelled diagram of the apparatus used for filtration under reduced pressure in Step 6.

(3)

| Question number | Answer | Additional guidance | Marks |
|-----------------|---|---|-------|
| 3(c) | <p>A labelled diagram that includes:</p> <ul style="list-style-type: none"> Buchner/side-armed flask (1) side-arm connected to pump/water aspirator (1) funnel with flat filter paper. (1) | <p>Exemplar diagram:</p>  <p>Do not award fluted filter paper</p> | 3 |