



35. Number of reactions

Time

1 h.

Curriculum links.

Chemistry of copper. Weak bases.

Group size

2– 4.

Materials and equipment

Materials per group

- ▼ 0.25 mol dm⁻³ aqueous copper(II) sulphate
- ▼ 0.25 mol dm⁻³ aqueous ammonium carbonate labelled A.

Equipment per group

- ▼ test-tubes
- ▼ test-tube racks
- ▼ glass rods
- ▼ pH paper
- ▼ lime water
- ▼ safety glasses.

Safety

Eye protection must be worn.

Risk assessment

A risk assessment must be carried out for this activity.

Commentary

This is an open problem and requires the students to exercise care and make careful observations. One approach is to look at solution A first. On warming, this solution evolves ammonia which gives the characteristic smell and carbon dioxide.

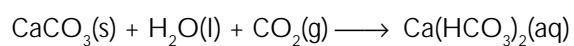
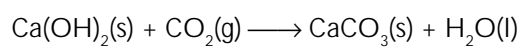
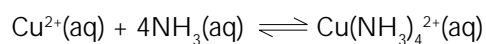
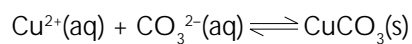
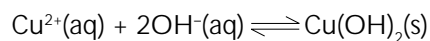
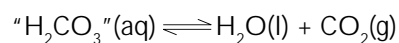
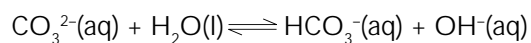
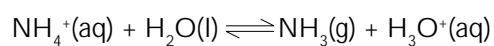
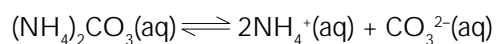
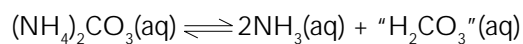
On mixing solution A with aqueous copper sulphate a blue/green precipitate (Cu(OH)₂·CuCO₃) is formed initially. On adding excess A this dissolves to form a deep blue solution of Cu(NH₃)₄²⁺(aq).

Evaluation of solution

The best answers are those that identify A, and identify the correct reactions. Some of these can be written as:



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- ▼ How many chemical reactions can you identify by using the solution of copper(II) sulphate and solution A? Identify A.