

Teaching notes

The resource is for use after the students have watched or carried out the two practicals - heating copper sulphate and heating cobalt chloride.

The practical itself could be shown as a teacher demonstration or done as a class practical. If it is not possible to carry out the practical, then there are several videos available showing the reactions. The following videos are available at the time of writing:

- copper sulphate being heated and then rehydrated
<http://www.youtube.com/watch?v=M6I1bZx7xvQ>
- heating cobalt chloride
<http://www.youtube.com/watch?feature=endscreen&NR=1&v=oC3FtY29FUu>
- rehydrating cobalt chloride
<http://www.youtube.com/watch?v=1WCISnxqbas>

Before carrying out the practical with students, an appropriate risk assessment must be carried out. Please refer to CLEAPPS guidelines for full risk information.

Precautions

- Copper sulphate and cobalt chloride solids may irritate the eyes and skin.
- Water added to anhydrous solids produces heat.
- Substances should be heated in heatproof test tubes in the hottest part of a Bunsen burner flame.
- **Eye protection should be worn** and care taken in handling hot apparatus.
- Both chemicals can cause damage to the environment and should be disposed of in accordance with current CLEAPPS guidelines.

Heating cobalt chloride

Before heating, the cobalt chloride was in colour.

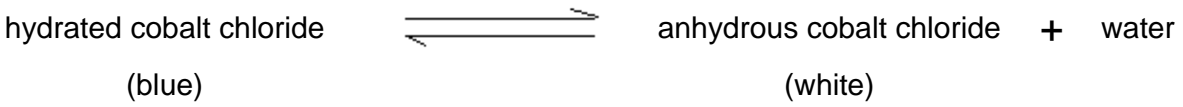
After heating, the cobalt chloride was in colour.

During heating it was observed that
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The copper chloride was left to cool and a few drops of water were then added. We observed that
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.....

This is an example of a chemical reaction.

It can be represented by a word equation:



Both copper sulphate and cobalt chloride changed colour when water was added to them.

How could this be useful in the chemistry laboratory?

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Answers

Heating copper sulphate

Before heating, the copper sulphate was **blue** in colour.

After heating, the copper sulphate was **white** in colour.

During heating it was observed that **it changed from blue to white and a vapour was given off.**

The copper sulphate was left to cool and a few drops of water were then added. We observed that **it changed from white to blue and heat given off.**

This is an example of a **reversible** chemical reaction.

Why do you think the arrow above points in both directions?

Because the reaction will go in both directions – it is reversible.

What does hydrated mean?

It contains water.

What does anhydrous mean?

It does not contain water.

Heating cobalt chloride

Before heating, the cobalt chloride it was **dark pink** in colour.

After heating, the cobalt chloride was **light blue** in colour.

During heating it was observed that **it changed colour from dark pink to light blue and a vapour was produced.**

The cobalt chloride was left to cool and a few drops of water were then added. We observed that **it changed colour from light blue to pink and heat was given off.**

This is an example of a **reversible** chemical reaction.

Both copper sulphate and cobalt chloride changed colour when water was added to them.

How could this be useful in the chemistry laboratory?

Since both change colour when water is added to the anhydrous chemical, they can be used to test to see if a liquid is or contains water. Cobalt chloride is available as papers which need to be heated to turn them blue and they will then turn pale pink if the substance is water.