

Lighting up copper

Education in Chemistry

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Technician's notes

This demonstration requires a darkened room. You will get the best effect in a fully dark room, but even in a regular lab with the curtains drawn the effect is visible.

Kit

Hazard and recipe book references are to [CLEAPSS](#) resources

- Eye protection
- 250 cm³ beaker or conical flask
- 50 cm³ measuring cylinder
- 10 cm³ measuring cylinder
- Ammonium hydroxide solution, 2 mol dm⁻³, 50 cm³ (irritant) (*Hazard 6, Recipe 6*)
- Luminol, 50 mg (irritant) (*Hazard 4B, Recipe 23*)
- EDTA disodium salt, 150 mg (irritant) (*Hazard 3C*)
- Copper wire (not insulated), copper strip or a copper coin (*Hazard 26*)
- 10 vol hydrogen peroxide (0.85 mol dm⁻³), 10 cm³ (*Hazard 50, Recipe 45*)

Safety and disposal

Wear eye protection. All liquids can be disposed of down the sink with plenty of water.

Preparation

Dissolve the luminol and EDTA in the ammonium hydroxide solution before adding the hydrogen peroxide. The solution will be stable for a number of hours. I have used it successfully 24 hours later, keeping it in a stoppered conical flask, but the glow is diminished.

In front of the audience

Add a copper coin or a copper strip to the solution. Immediately around the metal, a blue glow will appear. Further from the copper the glow disappears. This leads to a magical flame-like effect as the fluid moves around the metal. If you remove the metal from the solution, the reaction stops. If you leave the metal in the solution, it will take on a pale green-blue hue after a few minutes. After about 30 minutes the solution will be a royal blue colour and turbid.

