

The chemical properties of hydroxybenzene – student sheet

In this experiment you will be observing and interpreting some of the chemical reactions of hydroxybenzene (phenol) inside a plastic petri dish. Students must wear eye protection.

Procedure

1. Cover the worksheet with a clear plastic sheet.
2. Place the base of the Petri dish over the circle (below). Using the hydroxybenzene (phenol) sampling procedure (ask your teacher) place small quantities of hydroxybenzene (phenol) in the Petri dish over each of the five small circles.
3. In circle 1 add two drops of water, leave for 1 minute then add one drop of full-range indicator solution.
4. In circle 2 add two drops of 1 mol dm⁻³ nitric acid. Observe any changes over the next 5 min.
5. In circle 3 add two drops of iron(III) solution.
6. In circle 4 add two drops of sodium carbonate solution. Bearing in mind any conclusions that you arrived at in observing circle 1 what might you be looking for here?
7. In circle 5 add two drops of sodium hydroxide solution. Observe closely over the next minute. Add one drop of hydrochloric acid and observe closely.
8. When you have finished, add drops of sodium hydroxide to the Petri dish to dissolve the hydroxybenzene (phenol) and then mop up with tissue.

Questions

1. Can you give explanations for your observation?
2. Can you write equations for the reactions you have observed?

Health, safety and technical notes

- Students must wear suitable eye protection (Splash resistant goggles to BS EN1663).
- Hydroxybenzene (phenol) is hazardous and gloves should be worn (see CLEAPSS Hazcard [HC070a](#)).
- Nitric acid, 1 mol dm⁻³ HNO₃ (aq), is CORROSIVE (see CLEAPSS Hazcard [HC067](#)).
- Sodium hydroxide, 1 mol dm⁻³ is corrosive, iron(III) nitrate, Fe(NO₃)₃.9H₂O (aq), 0.2 mol dm⁻³, sodium carbonate 1 mol dm⁻³ and hydrochloric acid, HCl(aq), 1 mol dm⁻³, are of low hazard (see CLEAPSS Hazcard [HC091a](#), [HC055c](#), [HC095a](#), [HC047a](#)).
- Hydroxybenzene (phenol) is CORROSIVE, TOXIC by all routes and causes damage to organs on repeated or prolonged exposure (see CLEAPSS Hazcard [HC070a](#)). Dangerous if in contact with sodium nitrate (see CLEAPSS Hazcard [HC093](#)).
- Depending on the formulation of the Universal indicator, a 1:1 dilution with water might still be flammable. Keep away from sources of ignition.

