

The formation of 2,4,6-trichlorohydroxybenzene by the reaction between hydroxybenzene and chlorine gas

In this experiment you will be generating chlorine gas inside a plastic petri dish and reacting it with crystals of hydroxybenzene (phenol). You will detect the product by its distinctive smell.

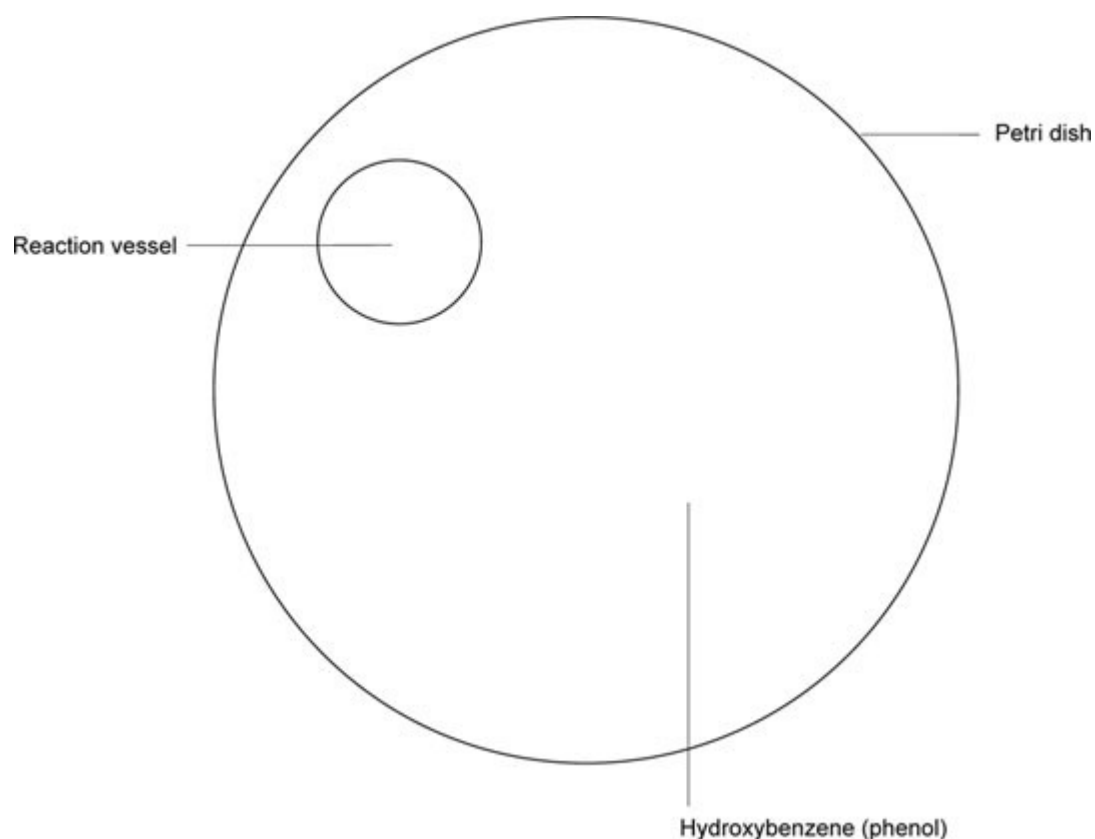
Instructions

1. Cover the worksheet with a clear plastic sheet.
2. Place the base of the petri dish over the circle overleaf.
3. Cut the end off the plastic pipette and place the small cup – the reaction vessel – at the edge of the petri dish as indicated.
4. Using the hydroxybenzene (phenol) sampling technique (ask your teacher) place a small quantity of hydroxybenzene (phenol) in the petri dish as indicated.
5. Add two drops of bleach to the reaction vessel followed by two drops of hydrochloric acid. Quickly place the lid on the petri dish.
6. Leave for 15 min then take off the lid. Smell briefly and cautiously – avoid inhaling more than you need. What kind of smell do you recognise?
7. When you have finished add a few drops of sodium hydroxide to the reaction mixture to dissolve the solid and then mop up the solution with tissues.

Questions

1. What do you observe and can you write equations for the reactions occurring:
 - a. to produce chlorine; and
 - b. how the chlorine reacts with the hydroxybenzene. What type of reaction is this?





Health & Safety

Students must wear suitable eye protection (Splash resistant goggles to BS EN166 3).

Hydroxybenzene (phenol) is Toxic, Corrosive and a Mutagen: gloves should be worn.

Sodium hydroxide solution, $1 \text{ mol dm}^{-3} \text{ NaOH (aq)}$, is corrosive.

Hydrochloric acid, $1 \text{ mol dm}^{-3} \text{ HCl(aq)}$, is low hazard

2,4,6-trichlorohydroxybenzene is harmful if swallowed, irritant to skin, eyes and respiratory system and a probable carcinogen (category 2) – care should be taken to inhale only the smallest amount needed for identification.

Eye protection is essential, and should be goggles to BS EN166 3 (not safety spectacles) if corrosive.

Credits

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Health & safety checked May 2018

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