Some reactions of hydrogen sulfide

Instructions

1. Cover the worksheet with a clear plastic sheet.
2. Place the base of the petri dish directly over the circle below. Place the reaction vessel in the centre.
3. At the corners of the triangle add drops of the test solutions as indicated below.
4. Add a small quantity of zinc sulfide powder to the reaction vessel followed by three drops of hydrochloric acid. Quickly replace the lid on the petri dish.
5. Record all your observations over the next 15 min. When you have finished add three drops of sodium hydroxide solution to the reaction vessel to stop the reaction.

Questions

1. What explanations can you give for your observations?
2. Why does sodium hydroxide stop the reaction?

Health & Safety

Students must wear suitable eye protection (Splash resistant goggles to BS EN166 3) and work in a well-ventilated room.

Hydrogen sulfide is an extremely poisonous gas but because it can be detected by smell at very low concentrations it is much less dangerous than other gases such as carbon monoxide which, although less poisonous, cannot be detected by smell.

Zinc sulfide, Hydrochloric acid 1 mol dm$^{-3}$ and Potassium manganate(VII) 0.01 mol dm$^{-3}$ are of low hazard.

Sulfuric acid 1 mol dm$^{-3}$ is a skin/eye irritant

Lead nitrate, 0.5 mol dm$^{-3}$ Pb(NO$_3$)$_2$ (aq) is a reproductive toxin, causes eye damage, causes damage to organs (especially the CNS) and is harmful to the aquatic environment. Avoid inhalation and skin contact.

Silver nitrate 0.2 mol dm$^{-3}$ causes eye damage and is harmful to the aquatic environment.

Credits

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Health & safety checked May 2018

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Two drops of lead nitrate solution

Reaction vessel with zinc sulphide and hydrochloric acid

Two drops of potassium manganate(VII) solution plus one drop of sulphuric acid

Two drops of silver nitrate solution

There must be a gap between the top of the reaction vessel and the lid of the petri dish

Lid of petri dish

Reaction vessel