

Microscale reactions of metals with acids – student sheet

In this experiment you will be looking at the reactions between various metals and acids.

Read the instructions before you start to make sure you understand the procedure.

Instructions

Note: as you do these experiments, observe carefully and record your findings.

1. Cover the table on your worksheet with a clear plastic sheet.
2. Place a few copper turnings in each box in the copper row.
3. Place one small piece of magnesium ribbon in each box in the magnesium row.
4. Place a few zinc granules in each box in the zinc row.
5. Place some iron filings in each box in the iron row.
6. Finally, place a few tin granules in each box in the tin row.

When all the pieces of metal are in place:

7. Add two drops of dilute hydrochloric acid to each metal in the hydrochloric acid column.
8. Add two drops of dilute nitric acid to each metal in the nitric acid column.
9. Add two drops of dilute sulfuric acid to each metal in the sulfuric acid column.
10. Finally, put one piece of copper turning into the Petri dish. Add two drops of concentrated nitric acid and immediately put on the lid.

	Hydrochloric acid	Dilute nitric acid	Sulfuric acid
Copper			
Magnesium			
Zinc			
Iron			
Tin			

You MUST use a Petri dish with a lid for the reaction between copper and concentrated nitric acid.

Follow step 10 in the instructions and record your observations below.

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Question

What did you observe? Give explanations for your observations.

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Health, safety and technical notes

- Wear eye protection throughout (splash-resistant goggles to BS EN166 3).
- Do NOT increase quantities mentioned and work in a well-ventilated laboratory. Nitrogen oxides are formed, gases are CORROSIVE and very TOXIC (fatal if inhaled).
- Hydrochloric acid, HCl(aq), 1 mol dm⁻³ is low hazard.
- Dilute nitric acid, HNO₃ (aq), 1 mol dm⁻³ is CORROSIVE.
- Concentrated nitric acid, HNO₃ (aq), 5 mol dm⁻³ is OXIDISING, CORROSIVE and gives off TOXIC fumes.
- Sulfuric acid, H₂ SO₄ (aq), 1 mol dm⁻³ is CORROSIVE.
- Magnesium ribbon is FLAMMABLE.
- Zinc powder, Zn(s), is FLAMMABLE and hazardous to the aquatic environment.