

Displacement reactions of metals

In this experiment you will be looking at the reactions between various metals and metal salt solutions.

Instructions

1. Cover the worksheet with a clear plastic sheet.
2. Place a copper turning 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 an iron nail in each box in the iron row.

When all the pieces of metal are in place:

6. Add two drops of copper sulphate(II) solution to each metal in the first column. Observe and record your observations.
7. Add two drops of magnesium nitrate solution to each metal in the second column. Observe and record your observations.
8. Add two drops of zinc chloride solution to each metal in the third column. Observe and record your observations.
9. Finally, add two drops of iron(III) nitrate solution to each metal in the fourth column. Observe and record your observations.

	Copper(II) sulphate solution	Magnesium nitrate solution	Zinc chloride solution	Iron(III) nitrate solution
Copper				
Magnesium				

Zinc				
Iron				

Try to place the metals in order of reactivity and write equations for any reactions that you observe.

Questions

1. What is the order of reactivity of the metals?
2. Write equations for any reactions that you observe.

Health & Safety

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

Copper(II) sulphate solution, 0.2 mol dm^{-3} , CuSO_4 (aq) causes eye damage and is toxic to aquatic life.

Zinc chloride 0.2 mol dm^{-3} , Iron(III) nitrate, 0.2 mol dm^{-3} $\text{Fe}(\text{NO}_3)_3 \cdot 9\text{H}_2\text{O}$ (aq), Magnesium nitrate, 0.2 mol dm^{-3} $\text{MgNO}_3 \cdot 6\text{H}_2\text{O}$ (aq) and all the metals apart from magnesium ribbon and zinc are of low hazard.

Magnesium ribbon is flammable and gives off highly flammable gases in contact with acids.

Zinc powder, Zn (s) is FLAMMABLE and hazardous to the aquatic environment.

Credits

© Royal Society of Chemistry

Health & safety checked May 2018

Page last updated August 2018