Experiment worksheet

5.4 Chemical change produces new substances

Pages 96–97 and 210

Experiment 5.4: Observing chemical reactions

Aim

To observe the reactants and products in chemical reactions.

Materials

- Spatula
- Copper carbonate (solid)
- Bunsen burner and heating mat
- Matches
- Two test tubes and test tube holder
- Baking soda (sodium bicarbonate)
- 5 mL of 1 M hydrochloric acid
- Thermometer
- Wooden splint
- Magnesium ribbon (1 cm length)
- ~0.5 M copper sulfate solution
- 100 mL beaker
- Tongs
- Piece of steel wool, about thumb size when rolled up

Method

PART A

1 Place a large spatula of copper carbonate in a test tube.

2 Set up the Bunsen burner.

3 Using a test tube holder, gently heat the test tube by passing it over the flame twice. Make sure the test tube is facing away from you and everyone else. Observe any changes and repeat until the powder changes colour.

4 Collect the waste powder in a beaker for disposal.

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FIGURE 1 When heating a test tube, be sure to point it away from you or anyone else close by.

PART B

1 Place the baking soda in a test tube to a depth of 0.5 cm.

2 Add an equal amount of 1 M hydrochloric acid to the test tube and observe.

3 Conduct a carbon dioxide test by holding a burning wood splint above the tube. If the flame goes out, carbon dioxide is present as one of the products of the chemical reaction.

PART C

1 Pour 5 mL of hydrochloric acid into the bottom of a test tube. Measure its temperature with the thermometer.

2 Add the magnesium ribbon to the test tube. Measure its temperature again.

3 Observe what happens using sight, touch (the outside of the tube only!) and sound.

PART D

1 Pour approximately 30 mL of the copper sulfate solution into a 100 mL beaker.

2 Use the tongs to place the steel wool into the copper sulfate solution.

3 Carefully observe the changes that occur to both the steel wool and the copper sulfate solution.

4 Collect the copper sulfate/steel wool solution in a beaker for safe disposal.

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Results

Include your observations here.

Discussion

1 What happened to the copper carbonate when it was heated?

2 Did it change when taken away from the heat?

3 Is this similar to the melting chocolate experiment? Why or why not?

4 What is produced in the baking soda and acid experiment?

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5 Why does the flame on the burning splint go out if carbon dioxide is present?

6 What happened to the magnesium metal?

Conclusion

What did you observe about the reactants and products of chemical reactions?

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