

Temperature and Dissolving

Student Worksheet

Name: _____

Class: _____

Date: _____

Aim

To examine how a change in temperature will affect the amount of solute that can dissolve in a solution.

Pre-Practical Questions

- 1) Sugar can dissolve in water. Is it soluble or insoluble in water?

- 2) Explain what it means for a solution to be saturated. Use salt water as an example.

Practical

Instructions

Go through the safety information with your teacher.

Collect your protective gear: a lab coat and safety goggles.

Ensure all long hair is tied back.

Clear the area you will use for your experimental work.

Read through the practical instructions and make sure you understand the requirements.

When you are ready you can begin.

Materials

- 1 x Test tube
- 1 x Stopper
- 1 x Test tube holder (tongs)
- 1 x Test tube rack
- 1 x Bunsen burner
- 1 x Bench mat
- 1 x Spatula
- Water
- Copper sulfate

Method

- 1) Place the test tube in a rack. Add about 5 cm of water and a spatula-load of copper sulfate.
- 2) Put the stopper into the end of the test tube, and shake it until the copper sulfate dissolves.
- 3) Add another similarly-sized spatula of copper sulfate to the test tube, place the stopper, and shake until the solid dissolves. Repeat this step until no more solid can dissolve.
- 4) Remove the stopper from the test tube.
- 5) Set up your Bunsen burner. Place it on the heat-proof mat, close the airhole, and securely attach the gas pipe to the gas source. Use whatever flame source you must light the Bunsen burner very quickly after the gas tap is turned on.
- 6) Grasp the test tube in the test tube holders or tongs, and gently heat the tube over the burner's flame (with the airhole open). Do not let the water boil, and point the test tube away from any other people.

- 7) Once the water has been heated, place the test tube back into the rack. Leave the holder attached to the test tube.
- 8) Add another spatula-full of copper sulfate to the test tube.
- 9) Use the test tube holder to lift the test tube, and gently swirl it to dissolve the remaining copper sulfate.
- 10) Once it has dissolved, leave the tube on the rack to cool. Observe what happens when the solution cools down.

Results

Fill out your observations of the solution in the table below:

Observations of a Heated Solution

Temperature (room temperature, heating, cooling)	Observations
Room Temperature:	
Heating:	
Cooling:	

Results Questions

1) What happened to the solution as you added copper sulfate?

2) What happened to the solution when you heated it?

3) What happened to the solution as it cooled down?

Discussion Questions

1) Why did the copper sulfate disappear as it was added to the water?

2) Why did the copper sulfate eventually stop dissolving?

3) Suggest a reason for why more copper sulfate was able to dissolve in hot water than in cold water.
