



California State University of Bakersfield, Department of Chemistry

Crystal Snowflake



Standards:

4th Grade, Earth Sciences, 4, b- know how to identify common rock forming minerals.

Introduction:

With a few ingredients that are easily accessible, crystals can be easily created to make artistic creations. Borax (sodium borate) is most commonly found in the form of a white powder that is made up of crystals that dissolve in water easily. Warmer water has molecules that are more spread apart which allows for more borax to be dissolved in the water, thus, making a supersaturated solution. As the water begins to cool, the water molecules begin to move closer together being unable to hold as much borax as when it was warmer. Crystals begin to form on top of one another as the water begins to cool down.

Materials:

- Pipe Cleaners
- String
- Wide-mouth jar or beaker
- Borax
- A pencil or popsicle stick
- Boiling water
- Food coloring
- Scissors

Safety:

- Always have an adult with you to help you during your experiment.
- Always wear eye protection and gloves when doing chemistry experiments
- Carefully handle all materials that require to be heated and are hot.

Procedure:

1. With Scissors, cut a pipe cleaner into three equal sections.
2. Create a six-sided snowflake by twisting the pipe cleaners together. The sides do not have to be perfect. Make sure the snowflake can fit in the beaker/jar being used.
3. Cut a 4" length of string and then tie one of it to the center of the snowflake. Tie the other end of the string to a Popsicle stick.
4. Fill the beaker/jar with boiling water, but do not fill it all the way.
5. Add in 3 tablespoons of borax **per each cup of water**. Stir in the borax one tablespoon at a time. Some borax may settle to the bottom.
6. Add some food coloring into the solution. (optional)
7. Take the snowflake attached to the Popsicle stick and rest it onto the beaker/jar so that the snowflake is completely submerged in the solution.
8. Place the beaker/jar somewhere where it won't be disturbed. Keep it there overnight.
9. The next day, crystals should have formed onto the pipe cleaners.

Data and Observations:

Record your observations in this space

What did you see? Anything you were not expecting? Describe it here.

Questions:

How did the borax look before mixing it into the boiling water? Did it resemble tiny crystals?

If cold water was used, would the crystals have formed?

Would other materials that resemble Borax have the same results if used to make snowflake crystal?

References:

1. Stevespanglerscience.com.
<http://www.stevespanglerscience.com/content/experiment/magic-crystal-snowflake> (July 17, 2012).
2. Sciencekids.co.nz. <http://www.sciencekids.co.nz/experiments/snowflake.html> (July 17, 2012).

Comments:

The hotter the water, the better it is to make a saturated solution. Also, moving the solution the around while the snowflake is in there really does disrupt the formation.