

Cobalt Colors

Student Worksheet

Name _____

Overview Today you'll write a secret message, or at least one that turns great colors!

What to Learn You should understand what a saturated solution is, and that cobalt chloride changes colors based on the presence of water. It is like a water indicator.

Materials

- cobalt chloride (CoCl_2) ([MSDS](#))
- cotton swab
- goggles
- test tube with stopper
- test tube stand
- funnel
- index card
- teaspoon
- distilled water
- hair dryer

Lab Time

1. Using your funnel, fill your test tube partway with water. Add 1 teaspoon of cobalt chloride. Cap and shake, using your thumb to hold the cap firmly, until the solids dissolve. Continue to add cobalt chloride, 1 teaspoon at a time, until you cannot dissolve any more into your solution. (You have just made a saturated solution.)
2. Using your cotton swab like a paintbrush, dip into the solution (your "paint") and write on the index card. Use a hair dryer to blow across the solution. (Be careful not to scorch the paper!) What happens? Stick it in the freezer. Now what happens? What if you blow dry it after it comes out of the freezer? What else can you come up with? What happens if you spritz it with water?

Disposal: Cobalt chloride is harmful in the environment, so should not be flushed down the sink. Wrap it up in a sealed container like a ziploc bag and throw it in your trash.

Bonus Experiment Idea! You can grow red crystals by cooling off a cup of hot water. Here's how: into a test tube, add 40 drops of hot water and 2 small spoon measure of cobalt chloride. Suspend a small pebble attached to a thread into the test tube (this is your starter-seed for your crystals to attach to). If after a day or two your crystals aren't growing, just reheat the solution and add a little bit more of the chemical.

ANOTHER Bonus Experiment Idea! By soaking a strip of tissue or crepe paper (it's got to be thin) in the cobalt chloride solution, you can create your own weather forecaster! Simply let dry and when it turns blue, you're in for blue skies and pink means it's going to rain. (It's basically a humidity gauge.)

Cobalt Colors Data Table

What other ways did you think of to change the humidity or the temperature in this experiment? Record your ideas and the results you observed.

Method	What color did you observe?
Blow dryer	

Exercises Answer the questions below:

1. What is a saturated solution?
2. Why did the blow dryer turn the message blue?
3. How can cobalt chloride help predict the weather?

Exercises

1. What is a saturated solution? (A solution in which the maximum amount of solute has been dissolved.)
2. Why did the blow dryer turn the message blue? (It took away the water that was attached to the cobalt chloride, making it less humid).
3. How can cobalt chloride help predict the weather? (It stays red when there's water around... that means rain is a possibility. It turns blue when it's dry, meaning blue skies and nice weather.)

Closure Before moving on, ask your students if they have any recommendations or unanswered questions that they can work out on their own. Brainstorming extension ideas is a great way to add more science studies to your class time.