

# Recrystallizing Crystals

Salt, Epsom salt, MSG, and kosher salt are all white crystals that at first glance appear similar. But when you look at them closely, you will notice some differences. Even though all of the crystals look different and have different names, two of them are chemically the same. In this activity, you will dissolve the crystals in water and allow them to recrystallize to figure out which two are really the same.

## Materials:

Salt  
Epsom salt  
Monosodium glutamate (MSG – Accent)  
Coarse kosher salt  
4 cups  
Hot tap water  
4 cotton swabs  
White paper  
Black permanent marker  
Teaspoon

## Procedures:

First, dissolve the crystals:

1. Label your cups salt, Epsom salt, MSG, and kosher salt. Then place about 1 teaspoon of hot tap water into each cup.
2. Place 1 level teaspoon of each crystal into its labeled cup. You and your partner should swirl each cup for about 1 minute.
3. Not all of the crystal will dissolve but enough will go into the water so that it can be recrystallized.



Next, recrystallize:

1. Divide a piece of paper into four equal areas. Label the areas salt, Epsom salt, MSG, and kosher salt. Use a black permanent marker to make a circle about the size of a quarter in each area.
2. Tilt the salt cup so that the liquid moves to one side. Dip a cotton swab into the liquid and spread it around on the black dot in the salt area of the paper. Dip and spread two more times to get a fair amount of liquid on the black dot.
3. Repeat step 2 for the other three crystal solutions. Allow the paper to sit undisturbed for about 1 hour. Look at the crystals with just your eyes and then look at them with a magnifier.
4. What do you observe? Do the salt and kosher salt seem similar?

## Think about this ...

You can get a different look at the crystals by allowing them to recrystallize in a different way. Let's try it! Get four clear plastic cups and label them salt, Epsom salt, MSG, and kosher salt. Slowly and carefully pour off the liquid from each of your dissolving cups into its matching clear plastic cup. Try to leave any undissolved crystal behind. Allow the cups to sit undisturbed for about 24 hours. What do you observe?

## Where's the Chemistry?

When the crystals are dissolved in the water, the tiny particles which make up the crystals are floating throughout the water. As the water evaporates, there are more particles of crystal in less water so the particles are more likely to run into each other. Some crystal particles touch each other and bond together like they were in the original crystal. Other particles add on in the same way until the crystal grows to a size you can see it.



The American Chemical Society develops materials for elementary school age children to spark their interest in science and teach developmentally appropriate chemistry concepts. The *Activities for Children* collection includes hands-on activities, articles, puzzles, and games on topics related to children's everyday experiences.

The collection can be used to supplement the science curriculum, celebrate National Chemistry Week, develop Chemists Celebrate Earth Day events, invite children to give science a try at a large event, or to explore just for fun at home.

Find more activities, articles, puzzles and games at [www.acs.org/kids](http://www.acs.org/kids).

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## Safety Tips

This activity is intended for elementary school children under the direct supervision of an adult. The American Chemical Society cannot be responsible for any accidents or injuries that may result from conducting the activities without proper supervision, from not specifically following directions, or from ignoring the cautions contained in the text.

### Always:

- Work with an adult.
- Read and follow all directions for the activity.
- Read all warning labels on all materials being used.
- Wear eye protection.
- Follow safety warnings or precautions, such as wearing gloves or tying back long hair.
- Use all materials carefully, following the directions given.
- Be sure to clean up and dispose of materials properly when you are finished with an activity.
- Wash your hands well after every activity.

**Never** eat or drink while conducting an experiment, and be careful to keep all of the materials used away from your mouth, nose, and eyes!

**Never** experiment on your own!

**For more detailed information on safety go to [www.acs.org/education](http://www.acs.org/education) and click on "Safety Guidelines".**

