

Investigating evaporation

Education in Chemistry

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<https://rsc.li/3AjGiFG>

Evaporation is an important physical process that we experience in everyday life and the laboratory. Help students to investigate this process with simple practicals.

Practical 1: evaporation rates

Investigate some factors that affect how quickly a liquid evaporates.

Equipment

- Test tube and rack
- Small beaker
- Evaporating dish
- Measuring cylinder (10 cm³)

Method

1. Measure 10 cm³ of water into each container.
2. Leave the containers in the same environment for a few days.
3. Measure the volume of water left in each container.
4. Calculate the volume of water lost from each container and relate this to the type of container used.

Notes

- You should find more water has been lost from the evaporating dish than the test tube as the water has a larger surface area in the evaporating dish.
- Investigate other factors such as temperature (find different areas in your lab or science department) or volume of air flow (close to an open window, on a shelf, on a bench).
- You can make the evaporation more obvious by colouring the water with a little food colouring.
- Use a bunged test tube of water as a control.

Practical 2: crystallisation of table salt

Dissolved substances become more concentrated as the solvent evaporates. Table salt forms cubic crystals over a few days when a saturated solution of the salt evaporates.

Safety: Wear eye protection. Ensure students handle the hot water carefully.

Equipment

- Two egg cups (or small beakers)
- A plate
- A teaspoon
- Natural fibre string, 20–30 cm long
- Table salt (sodium chloride)
- Hot water from a kettle

Method

1. Add 3–4 teaspoons of table salt to each cup and half fill with just-boiled water.
2. Stir to dissolve as much salt as possible. This will create a saturated salt solution – ie no more salt can dissolve.
3. Place the egg cups on a plate about 5 cm apart.
4. Place one end of the string in each egg cup.
5. Let the middle of the string hang down between the egg cups.
6. Leave this for a few days and you'll see the effects of evaporation of a saturated salt solution.



Notes

- Encourage the students to stir the salt/water mixture thoroughly to dissolve the maximum amount of salt.
- Students may be tempted to interfere with the practical – ensure it is placed somewhere away from curious fingers!
- If possible, carry out the practical when you will see the group at regular intervals – this will allow them to monitor the crystallisation process. They could take photos and include this in a practical report.
- When the water has fully evaporated, ask the students to look at the range of crystals formed – is there any pattern to where smaller and larger crystals form?
- Some very high-quality crystals can form – students could use close-up photos in their art lessons, making links between the subjects. Many beautiful crystals are formed by other substances, eg [bismuth](#) and [gypsum](#) (calcium sulfate-2-water).