

Emerging Line

A Precipitation Demonstration

Introduction

A cure for the common precipitation demonstration! The following method allows precipitation reactions to take place slowly, providing time for observations and explanations of the reactions as they occur.

Concepts

- Diffusion
- Precipitation

Materials

Silver nitrate, AgNO_3
Sodium chloride, NaCl
Sodium iodide, NaI
Water, deionized

Overhead projector
Petri dishes, 2
Spatulas, 3

Safety Precautions

Silver nitrate is a corrosive solid and can cause burns. It may also stain skin and clothing—avoid contact with eyes and skin. Sodium iodide is slightly toxic by ingestion. Wear chemical splash goggles, chemical-resistant gloves, and a chemical-resistant apron. Please review current Material Safety Data Sheets for additional safety, handling, and disposal information.

Procedure

1. Place two Petri dishes on an overhead projector and fill approximately $\frac{1}{3}$ to $\frac{1}{2}$ full with deionized water.
2. Use a clean spatula to add a small scoop of silver nitrate crystals to the water at the edge of the Petri dish.
3. Directly opposite the silver nitrate, add a small scoop of sodium iodide crystals to the water in the Petri dish using a clean spatula (see Figure 1).
4. The solids will slowly dissolve and diffuse through the water. As the ions meet in the center of the Petri dish, a line of precipitate will begin to form and will continue to grow until across the length of the dish (see Figure 2).
5. Repeat steps 2–5 in a second Petri dish replacing the sodium iodide with sodium chloride.

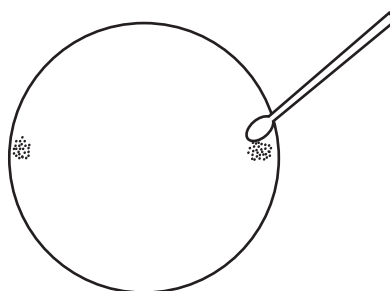


Figure 1.

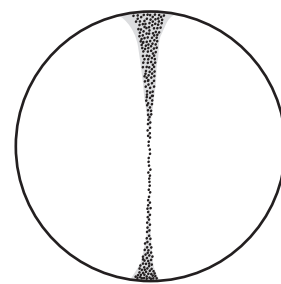


Figure 2.

Disposal

Please consult your current *Flinn Scientific Catalog/Reference Manual* for general guidelines and specific procedures governing the disposal of laboratory waste. The waste solutions may be disposed of according to Flinn Suggested Disposal Method #26a.

Connecting to the National Standards

This laboratory activity relates to the following National Science Education Standards (1996):

Unifying Concepts and Processes: Grades K–12

- Evidence, models, and explanation
- Constancy, change, and measurement

Evolution and equilibrium

Content Standards: Grades 5–8

Content Standard A: Science as Inquiry

Content Standard B: Physical Science, properties and changes of properties in matter

Content Standards: Grades 9–12

Content Standard A: Science as Inquiry

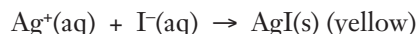
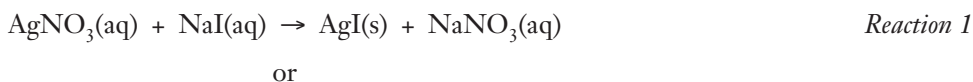
Content Standard B: Physical Science, structure and properties of matter, chemical reactions

Tips

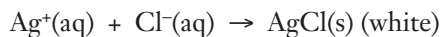
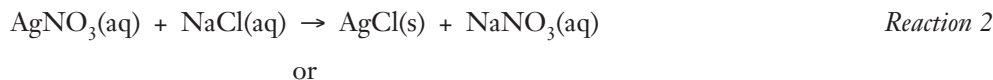
- Place an acetate sheet under the Petri dish to protect the overhead projector from spills.
- Many different salts may be used. Any two solutions that form a precipitate will react in a similar fashion using this method. You may even try adding three salts to the same Petri dish to achieve a y-shaped line. The reaction between silver nitrate and sodium iodide is interesting since both start out as colorless salts but form a yellow precipitate.
- Glass or plastic Petri dishes may be used for this demonstration.

Discussion

The precipitate formed in the first reaction is silver iodide.



The precipitate formed in the second reaction is silver chloride.



Reference

deVos, Wobbe and Verdonk, A., "A New Road to Reactions," *Journal of Chemical Education*, August 1985, pp 648–9.

Flinn ChemTopic™ Labs, Volume 6, Irene Cesa, Ed., Flinn Scientific, Inc., Batavia, IL, 2004.

Materials for *Emerging Line—A Precipitation Demonstration* are available from Flinn Scientific, Inc.

Catalog No.	Description
S0274	Silver nitrate, 5 g
S0083	Sodium iodide, 25 g

Consult your *Flinn Scientific Catalog/Reference Manual* for current prices.