

Chemical Sunset

Purpose

To illustrate the formation of a colloid and show how colloids diffract light.

Materials

beaker or Petri dish to cover template	concentrated HCl
scenic template for overhead	10 mL graduated cylinder
0.03 M Na ₂ S ₂ O ₃	stirring rod

Procedure

1. Dissolve 3.5 g Na₂S₂O₃ • 5 H₂O in 500 mL water.
2. Place scenic template on overhead projector (the demo room has the templates).
3. Place beaker or Petri dish over scenic template.
4. Add enough Na₂S₂O₃ to cover bottom of the container.
5. Add about 5 mL concentrated HCl and quickly stir the solution.
6. Dim lights and observe color changes.

Additional Information

1. Reactions are:
$$2 \text{H}^+ + \text{S}_2\text{O}_3^{2-} \rightarrow \text{H}_2\text{S}_2\text{O}_3$$
$$\text{H}_2\text{S}_2\text{O}_3 \rightarrow \text{H}_2\text{SO}_3 + \text{colloidal sulfur.}$$
2. Sodium thiosulfate pentahydrate is also known as hypo. It is used in photography development.
3. Formation of colloidal sulfur should take 25-30 seconds.

Questions for the Students

1. How is a colloid different than a solution?

Disposal

Solutions should be placed in properly labeled waste containers.

Reference

Summerlin, L. and Ealy, J. Chemical Demonstrations: A Sourcebook for Teachers, Vol. 1, 1985.