Crystal Ball

Purpose
To illustrate the crystallization of a supersaturated solution.

Materials

- Sodium acetate trihydrate, $CH_3COONa \bullet 3H_2O$
- Round bottom flask or Erlenmeyer flask with rubber stopper
- Hot plate or Bunsen burner
- Wash bottle
- Distilled water

Safety

- Read the SDS sheets for all chemicals before using them.
- Wear safety glasses and gloves.

Procedure

1. Fill a very clean flask with sodium acetate trihydrate crystals.
2. Heat the flask on a hot plate (or gently with a Bunsen burner) until the crystals dissolve in their own water of hydration. (A small amount of water can be added if needed).
3. Continue heating the liquid for a couple of minutes but do not let it boil over.
4. Allow the liquid to cool to room temperature, undisturbed.
5. Wash down the sides of the flask with a small amount of distilled water; then gently stopper the flask.
6. When ready, remove the cap and add one small crystal of sodium acetate trihydrate.
7. Have students feel the flask immediately after crystallization has taken place.

Results

- Upon addition of the seed crystal to the supersaturated solution, the crystal starts to grow outwards until the entire flask is solid white.
- The flask should feel warm.

Follow-up Teaching Notes

- The flask feels quite warm to the touch due to the release of heat upon crystallization

$$solute_{(aq)} \rightarrow solute_{(s)} + heat$$

Connections

- Solutions (super saturation), heat of solution.

Extension

- Slowly drip saturated sodium acetate solution on a desk from a buret to produce a crystal column.

Disposal/Clean-up

- The flask can be sealed and reused many times (a small of amount of water may be needed to aid dissolving).