

Fire Snowballs

Purpose

To demonstrate a colloidal system that can be ignited into a fireball.

Materials

calcium acetate (hydrated)	50 mL beakers (2)
ethanol	100 mL graduated cylinder

Procedure

1. Prepare saturated solution of calcium acetate (Solution A). Dissolve 37 grams of CaCH_3COO in 100 mL of cold (0 C) distilled water. **Must be prepared prior to demo, to allow solution to cool.**
2. Place 5.0 mL of Solution A into a 50 mL beaker.
3. Measure out 30 mL of denatured ethanol (Solution B) and pour it into another 50 mL beaker.
4. Pour Solution A into Solution B and back again. A gel will form.
5. Remove the gel into your hands and form a sphere, squeezing out as much water as possible.
6. Rinse your hands, removing any excess solution.
7. With your hands still wet, turn off the lights, ignite the sphere with a match and toss the fireball from hand to hand. Three balls can be juggled.

Additional Information

1. This is sterno. The flame is cold enough to handle with wet hands. Do not allow hands to dry, for the flame will be too hot.
2. The gel is a colloidal system consisting of a liquid (alcohol) dispersed in a solid (calcium acetate).
3. The structure of the gel is unclear. The calcium acetate probably forms a network that traps ethanol molecules.
4. Other gels include jelly, gelatin, agar.

Questions for the Students

1. What is a gel?
2. What are some properties of this gel?
3. Name some other gels.

Disposal

Solids can be thrown into the trash, and solutions can be washed down the drain with excess water.

Reference

Summerlin, L. & Ealy, J; Chemical Demonstrations, A Sourcebook for Teachers, 1985.