

Liquid Nitrogen

Purpose

To demonstrate the effects of the loss of elasticity for a variety of substances.

Materials

liquid nitrogen	one liter beaker
rubber ball	flowers
mercury	crackers
banana	Dewar
asbestos gloves	board and nail

Procedure

1. Bounce a rubber ball on the floor. Pour out some of the liquid nitrogen from the Dewar into a one liter beaker. Place ball into the beaker. Freeze the ball and then throw it against a concrete surface.
2. Dip a flower into the nitrogen. Break it against the demonstration table.
3. Dip crackers into the nitrogen. Allow students to chew the crackers. Watch the “smoke” exit their mouths.
4. Dip a peeled banana into the dewar of nitrogen. After freezing it completely use it to pound a nail into a piece of board.

Additional Information

1. Variation: Mercury may be used instead of a banana. It is toxic. Pour about 100 mL of mercury into a paper cup. Dip the cup into the nitrogen, adding a popsicle stick into the mercury. After freezing, peel the paper away and use the “mercury hammer” to drive a nail into a piece of board.
2. A variation involves a carbon dioxide balloon attached to a large test tube. Dip the test tube into the liquid nitrogen. The carbon dioxide will sublime from the balloon into the test tube.

Disposal

Things that shatter can be thrown away. Extra liquid nitrogen can be used for other demos or allowed to dissipate.

Reference

Alyea, H.N. & Dutton, F.B., Tested Demonstrations in Chemistry, 1965.