

INSTANT GLOP

Sodium polyacrylate, a superabsorbant polymer

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Instant Glop is a component of Mad Scientist Glowing Glop from Mattel, Inc. and it is composed of a superabsorbant material. The Glowing Glop is actually a gel-like material consisting of beads of superabsorbant filled with water. The set contains packets of Instant Glop (3 grams of superabsorbant), and Powdered Light, a phosphorescent material (3 grams of zinc sulfide), that are mixed with water to make an instant Glowing Glop.

Superabsorbants were originally developed by the United States Department of Agriculture in 1966. This material consisted of a graft copolymer of hydrolyzed starch-polyacrylonitrile (polyacrylonitrile is commonly known as Acrilan, Orlon, or Creslan). The intended use was for additives for drilling fluid in off-shore secondary oil recovery operations and as agricultural thickeners. It was marketed to the public as WaterLoc or Water Grabber, intended to be placed in the soil of plants in arid regions where drip irrigation was used. In this form, the gel produced would retain water for the plants to utilize while minimizing water loss by evaporation. These materials were followed by synthetic superabsorbants that are polyacrylic and polyacrylonitrile based. Some of these materials are capable of absorbing up to 2000 times their weight of distilled water. The superabsorbant used in Instant Glop is capable of absorbing over 800 times its weight of distilled water. Due to the large amount of water these substances can absorb, they are known as “Super Slurpers”.

A popular application of “Super Slurper” is in the liners of Ultra Pampers Plus disposable diapers and other diapers labeled as being superabsorbant. Under this application, the polymer gel can absorb up to 80 times its weight in liquid.

PROCEDURE

1. Materials needed:

- 5 oz paper or plastic cup
- stirrer (popsicle stick)
- water
- salt
- plastic bag to store glop (zip-lock type, or bag with twist tie)

Part 4A:

- superabsorbant material (sodium polyacrylate) available from Flinn Scientific Inc.
- balance or 1/2 teaspoon measure (2.5 mL)
- 100 mL measure or graduated cylinder

Part 4B:

- ultra-absorbent diaper
- large plastic bag, approximately 16 x 18 in.
- 50 mL measure or graduated cylinder
- scissors

2. Safety Precautions:

The superabsorbant material may be a mild skin and body tissue irritant. Wash hands after using this material.

3. Disposal:

Dispose of superabsorbant material in the trash.

4. Experimental Procedure:

A. Making Instant Glop Using Superabsorbant Material.

Weigh out 1.2 grams or measure a level 1/2 teaspoon (2.5 mL) of superabsorbant material. Place the material in a 5 oz paper or plastic cup.

Add 100 mL of water to the cup and stir. Describe what occurs.

Touch the material in the cup. Describe it.

Store the glop in a sealed plastic bag.

B. Making Instant Glop From a Disposable Diaper

Obtain an ultra-absorbent diaper.

Cut the diaper into one or two inch strips

Place the strips in a plastic bag. Seal the bag and shake it well.

Open the plastic bag and remove the diaper and any loose cotton, saving the powder in the bottom of the bag.

Transfer the powder to a 5 oz paper or plastic cup. Add 50 mL of water to the powder in the cup and stir. Describe what occurs.

Alternate Method: Open a sheet of newspaper on a tabletop. Over the newspaper, dissect an ultra-absorbant diaper. Tear open the linings. How many linings are there? What are their purpose? Pull the cotton apart. Rub powder free from the cotton and the outer liner. Discard any loose cotton. Pick up newspaper and pour superabsorbant material into a small cup.

Add 50 mL of water to the powder in the cup. Describe what occurs.

Touch the material in the cup. Describe it.

Store the glop in a sealed plastic bag.

C. The Effect of Salt on Instant Glop

Place some Instant Glop in a paper cup.

Add a small amount of salt and stir. Describe what happens.

What other applications would superabsorbants, such as the ones encountered in this experiment, be useful for?