

DISAPPEARING WATER

(SUPERABSORBANT MATERIAL)

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Superabsorbents were originally developed by the United States Department of Agriculture in 1966. This material consisted of a grafted 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. 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 superabsorbent used in this demonstration, sodium polyacrylate, 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”. One of the most common applications of “Super Slurper” is in the liners of Ultra absorbent 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.

MATERIALS NEEDED:

- 8 oz, or larger, white foam cup (expanded polystyrene)
- water
- sodium polyacrylate (available from Flinn Scientific Inc.)

SAFETY PRECAUTIONS:

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

DISPOSAL:

Dispose of superabsorbant material in the trash.

PROCEDURE:

Add approximately 1/2 teaspoon (2.5 mL) of superabsorbant material to an 8 oz foam cup.

Add between 50 and 100 mL of water to the cup.

Place a piece of heavy card stock over the top of the cup and turn it upside down. Ask the audience what is happening.

Remove the card from the cup. What happened?