

Slime-Polymers

The Action Liquid glue is mixed with a Borax solution to create a slimy, elastic polymer. When pulled slowly, it will stretch but when pulled quickly it will break.

Grade Level
Grade 6 - Chemicals and Reactions
Grade 8 - Solutions
Grade 9 - Chemistry and You
Grade 10 - Physical Science
Grade 10 - Science Fair
Grade 12 - Solubility and Solutions

Materials
50 ml white glue
50 ml water
15 ml Borax
250 ml water
Food colouring (optional)
Popsicle sticks (for stirring)
2 Beakers
Ziploc Bag

Instructions Combine the white glue and 50ml of water in one beaker.
Add a couple of drops of food colouring to the glue mixture, but not too much because it will bleed out onto your hands if there is too much.
Combine the Borax and 250ml of water in the other beaker. This is to be a saturated solution, so if all of the Borax dissolves add a little at a time until it no longer dissolves.
Stir the glue solution continuously as you slowly add the Borax solution. Add enough Borax solution until most of the mixture has formed a clump.
Take the clump out of the beaker and put it in a Ziploc bag. Work the "slime" with your hands until it is smooth and easy to handle.

Safety Do not eat the slime.

Hints The slime can then be stored in a Ziploc bag. If it gets dried out try adding a little water and working it in. If the slime gets too dry it will not come back to the way it was.
Borax is a laundry detergent booster and is found

in the laundry aisle of the grocery store. It can be washed down the drain.

Science
Principle

Liquid glue is made up of long stringy molecules that exist in an unordered manner. The chemicals in the Borax solution hook these unordered molecules together forming an ordered matrix of "strings". In this way, the slime behaves as one elastic unit with great flexibility.

Monomers are molecules of a single unit.

Polymers, like slime, are made up of many repeating monomers through a chemical reaction called polymerization. A polymerization agent is a substance that causes the polymerization reaction to occur. For example, the Borax solution is the polymerization agent changing the liquid glue into elastic solid polymer. Polymers make up the reproductive, circulatory, transport and structural systems of living things. They are also evident as Polyethylene, a man-made polymer used in making plastic bags.

Another demonstration of polymers and their properties requires 2 opaque glasses, one full of water and the other apparently empty. In the empty glass, place a thin layer of Polyacrylamide gel powder in the bottom and then transfer the full glass of water to the "empty" one. It will form a gel matrix polymer almost immediately. Try to pour it back into the other glass. The Polyacrylamide gel is available in science stores and is the key component of "ultra-absorbent" diapers.

Video Clip