

Silly Putty and Glarch Lab

Theory: colloids, polymers, solution chemistry

Purpose: preparation of a colloid-type material

Materials: Elmer's glue- all white, Tap water, Stirring rod, Food coloring (optional), Plastic wrap, plastic bags , 25mL graduated cylinder, paper cup, Liquid starch

Sodium Borate(Borax) solution 4% (4g sodium borate mixed with 100mL of water)

Procedure:

Part A: Silly Putty

1. Fill a paper cup with about half an inch of glue. **Do not pour the glue into any glassware!**
2. Using the graduated cylinder, add 20mL of tap water to the glue in the cup. If using food coloring, add color to water first.
3. Stir well. Rinse out the graduated cylinder.
4. Using the graduated cylinder, measure 5mL of Sodium Borate solution. Add it to the glue mixture and stir well.
5. Remove solid material from the cup and place on a piece of plastic wrap.
6. Pull any solid off the stirring rod; let the material stand for two minutes (It will be sticky for a few minutes)
7. When you are finished making the substance, store the material in a plastic bag, or wrap it in plastic wrap.

Part B: Glarch

1. Fill a paper cup $\frac{1}{4}$ full of glue and $\frac{1}{4}$ full of liquid starch.
2. When it sticks to the splint or stirrer, pour the contents into a baggie and knead until the mixture no longer sticks to the bag.
3. Remove and examine properties. Keep stored in the baggie to prevent drying. If the material gets on clothing, desks, etc., allow to dry and brush off- **Does not stain!**

Data - Observations:

Texture:

Color:

Luster:

Elasticity (after 5 minutes):

Elasticity (after 20 minutes):

Odor:

Discussion:

1. What happens when the material is pulled hard and flat?
2. Design a simple test to determine the density of the putty.
3. You used a solution of Sodium Borate (Borax). What are two practical uses for Borax?
4. Why is a paper cup used for the glue instead of a graduated cylinder?
5. Do you think rubber cement would work as a replacement for Elmer's glue? Why or why not?
6. Terms to review... define the following:
 - a. Amorphous
 - b. Supercooled liquid
 - c. Elasticity
 - d. Suspension
7. Name the solution(s) and/or suspension(s) used in part A.
8. What is the difference between the colloids that you made?
9. Why was some of the silly putty liquidy?
10. Why are these polymers?

Conclusion:

Resources: