INTRODUCTION/THEORY

A food thickening agent, guar gum, and a laundry detergent, borax will be used to create a polymer. The water soluble fraction (85%) of guar gum is called Guaran. Guaran is the principle polysaccharide found in the endosperm of guar seeds. The Tetraborate ions in borax cause a cross-linking of guaran chains, producing a non-Newtonian fluid, also know as a polymer. Many of the differences in polymers are due only to the degree of cross-linking that occurs in the polymer.

Chemists are often responsible for the synthesis of new materials. In this experiment, you will design a procedure that will create a substance with unusual (non-Newtonian) properties.

SAFETY PRECAUTIONS:

Wash hands after handling. Do not ingest the material or use it for any manner which it is not intended. The optional food dye (used to color Slime) may stain clothing, upholstery, or wood surfaces. Clean up any spilled Slime as soon as possible.

PROCEDURE:

Design a procedure which will create a slime-like substance with unusual (non-Newtonian) properties.

1. Carefully measure 10mL of water into a graduated cylinder, then pour into a 50mL beaker. Add food coloring (optional): 1drop for primary color, 2drops for other color combinations (purple, turquoise, orange, etc.).
   a. Measure 0.1-0.4g of guar gum in a weighing dish.
b. Add it to the water in the beaker. Stir until completely dissolved. The mixture should thicken somewhat within 1-2 minutes.

2. Add 1mL of the 4% borax solution (15drops ≈ 1mL) and stir. The mixture should gel in 1-2 minutes.

3. Repeat the procedure, modifying the amounts of guar gum until you are able to produce Slime with the properties/feel/look that you desire.

4. Finally, prepare a large enough batch of Slime to take with you. Use 10 times the amounts (only 1-2drops of food dye) which you used to create Slime on a smaller scale. Store the Slime in an airtight container (like a zip-loc bag) to keep it from drying out. Be sure to label your substance!
**SLIME PROPERTIES**

After making you gel, grasp the material and knead it into an elastic, semi-rigid mass. Examine the properties of this substance by trying the experiments below.

What happens if you…

1) suspend the gel from your hand?

2) stretch the gel slowly?

3) stretch the gel quickly?

4) place the gel on a flat surface?

5) Place the gel into a container?

**CONCLUSION**

Do the properties/characteristics of your slime indicate it's a solid or a liquid?