

LAB: GAK ATTACK

Students: Please read the following information given below, and then come to class on your lab day with the following already prepared in your notebooks:

1) Date, 2) Partner, 3) Title, 4) Purpose, 5) Materials, 6) Safety, and 7) Procedures & Observations

No Data Section is needed and no formal lab report is necessary.

Questions on the last page need to be printed out. You will hand in these questions one week after the completion of the lab.

GAK ATTACK

Tiny molecules strung in long repeating chains form polymers. Why should you care? Well for one thing, your body is made of them. DNA, the genetic blueprint that defines people and other living things, is a polymer. So are the proteins and starches in the foods we eat, the wheels on our skateboards, in-line skates, and the tires on our bikes and cars. In fact, we are surrounded by polymers every day, everywhere we go. In this lab, a new substance will be created and its properties will be observed. Remember, observations should be made immediately after each step of the procedures is completed.

2 Tbsp of white glue will be added to a cup, and then 1 Tbsp of water will be added and the contents will be stirred. Once the water has been added to the glue, come up to the teacher and add 1 drop of food coloring. This **MUST** be done before the next step is completed. 4 tsp of a 4% borax solution (sodium tetraborate and water) will then be added to the cup. Make sure the contents are stirred some more.

WARNING: Do not add all the borax at once and keep stirring the contents as the gak will thicken gradually. Once the glue, water, and borax have been added, carefully pull out the gak and place it in the hands of your lab partner (leave excess liquid in cup). If gak is still sticky, add another tsp of borax to the gak in the hands of the lab partner, and then mix hands together. Continue the process until the gak feels solid.

Explore the properties of the new material. Try to shape it, stretch it, first very slowly and then more rapidly, and finally attempt to bounce it. Do not throw the gak around. Store your samples in a plastic bag.

Do not leave the borax solution on your skin for a long period of time. Do not rub your eyes if you touched the borax. Do not taste the substance. Wash your hands with soap after the completion of this lab.

After the completion of this lab, clean up the lab station thoroughly. There shouldn't be any pieces of gak in the sink!!

NOTE:

Knowing just how much Borax solution to add is the trick to this experiment. If you add too little, the new material will contain excess glue (the polymer part) and it will be sticky. If you add too much, the new material will be very wet. Touch the gak with your hands when it doesn't look like a liquid anymore. If it feels sticky, try adding a little Borax solution. If it feels very wet and slippery (but is not still runny), remove it from the container and kneed it in your hands. In a few minutes, any extra Borax solution will evaporate or be absorbed.

Name _____

Period _____

Date _____

Lab Group # _____

Lab: GAK ATTACK

QUESTIONS: (answer in complete sentences)

1. Compare and contrast the properties of gak with those of the materials you started off with. How is it different from what you started off with? (2pts)
2. Propose an explanation for what may have happened at the molecular level to account for the new properties of your solid (you will want to use the internet to research your answer). Properly cite urls used. (2 pts)
3. Name and write the chemical formulas for all of the compounds that were used to produce the new substance. (3 pts)
4. Propose a possible reason why the GAK has the unique property of sometimes being able to be stretch, while at other times the GAK can be broken apart. (3 pts)