Silly Putty Lab

Chemistry:

Elmer’s Glue is made up of polyvinyl acetate. The borax molecules react with glue molecules (relatively long polymer chains) to form new bonds between one borax and two glue molecules.

The linking of two glue molecules via one borax molecule is called **polymer cross-linking** and it makes a bigger polymer molecule, which is now less liquid-like and more solid. The silly putty is held together by very weak intermolecular bonds that provide flexibility around the bond and rotation about the chain of the cross-linked polymer.

Directions:

1. Wear goggles.
2. Add one cup of glue and one cup of water to empty, clean plastic milk jug.
3. Mix thoroughly with popsicle stick.
4. Add 2-3 drops of food coloring.
5. Mix thoroughly with popsicle stick.
6. Add one cup of borax solution.
7. Mix thoroughly with popsicle stick.
8. Take silly putty out of jug and knead with hands.

Observations:

1. Observations of pulling the silly putty slowly:

2. Observations of pulling the silly putty quickly:

Questions:

1. How do the physical properties of the glue/water mixture change as a result of adding the borax solution?

2. What would be the effect (your thoughts) of adding more borate solution?

3. Press the silly putty against your hand. Describe what happens.

Don’t forget to clean up and wash your hands!
4. Try to roll the silly putty into a ball on the table. Describe what happens.

5. Stretch the silly putty slowly. How long can you stretch it? (cm)

6. Based on the background information, why does silly putty stretch instead of breaking quickly?

7. How does silly putty act like water? Why?

Don’t forget to clean up and wash your hands!