

CHEMISTRY LAB: PREPARATION OF A PUTTY-TYPE MATERIAL

What to turn in:

Data Table – 9 entries

Questions #1-6

Objectives

- To prepare a putty-like material
- To test the properties of the substance
- To review the concepts of true crystalline solids vs. amorphous solids

Materials

white Elmer's Glue-All
tap water
food coloring, optional
graduated cylinder
ruler

4% sodium borate (borax) solution:
($\text{Na}_2\text{B}_4\text{O}_7 \cdot 10\text{H}_2\text{O}$)
stirring rod or plastic spoon
plastic wrap, plastic bags
small (5 oz.) paper or plastic cup

Procedure

- 1) Fill a paper cup with about a half inch of glue. **DO NOT POUR THE GLUE INTO ANY GLASSWARE!**
- 2) Using the graduated cylinder, add 20 mL of tap water to the glue in the cup. If using food coloring, add color to the water first.
- 3) Stir well. Rinse out the graduated cylinder.
- 4) Using the graduated cylinder, measure 5 mL 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 or plastic spoon; let the material stand for two minutes. (It will be sticky for a few minutes).
- 7) *Complete the data table on the back of this lab sheet.*
- 8) When the lab is finished, store the material in a plastic bag, or wrap it in plastic wrap.

Questions

- 1) What happens when the material is pulled hard and fast?
- 2) Design a simple test to determine the density of the putty.
- 3) You used a solution of sodium borate (borax). What is a practical use for borax?
- 4) What is the chemical formula for sodium borate?
- 5) Why is a paper cup used for the glue instead of a graduated cylinder?
- 6) Do you think rubber cement would work as well instead of Elmer's Glue? Why or why not?

DATA TABLE →

DATA TABLE

1) GRAVITY

a) Shape the putty into a ball and set it on the lab counter.

b) How many seconds or minutes does it take to begin flattening?
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2) BOUNCE TEST: Shape the putty into a ball. Hold it 12 inches above the lab counter. Drop it gently. Record observations.

3) FLATTENING

a) How flat of a layer, in mm, can the putty be pressed?
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b) How long does it stay as flat as it was pressed?

4) COMPRESSIBILITY

a) Describe how the putty compresses after 5 minutes.

b) Describe how the putty compresses after 15 minutes.
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5) COLOR:

6) ODOR:

7) TEXTURE: How does the putty feel? Be descriptive.

8) LUSTER: Is the putty shiny or dull?

9) ELASTICITY: Slowly pull the putty apart.
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a) How far, in mm or cm, can it be stretched without breaking after 5 minutes?
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b) How far, in mm or cm, can it be stretched without breaking after 15 minutes?
