

California State University of Bakersfield, Department of Chemistry

Ziploc Baggie Pencil Puncture



Standards:

HS-PS1-2. Construct and revise an explanation for the outcome of a simple chemical reaction based on the outermost electron states of atoms, trends in the periodic table, and knowledge of the patterns of chemical properties.

Introduction:

Have you ever attempted to push a sharp object through a Ziploc bag containing water? Most likely, it would leak all over, right? Well, this experiment will show you how to push sharpened pencils through a Ziploc bag filled with water without it leaking. The Ziploc bag is made up of Polyethylene. It contains molecules called polymers. The polymers cause the baggie to stretch and seal around the pencil preventing the water from escaping.

Materials:

- Ziploc sandwich bag
- 3 sharpened pencils
- 2 cups of water (400 mL)

Safety:

- Always have an adult with you to help you during your experiment.
- Always wear eye protection doing this experiment

Procedure:

1. Fill the Ziploc bag with 2 cups of water.
2. Seal the baggie so no air or water escapes.

3. Hold the sealed bag up, take a pencil, and puncture the bag an inch from the top of the bag. Continue to push the pencil downward in a diagonal direction through the water. Puncture the bag on the other side to create an exit hole toward the bottom of the bag. Continue to hold the baggie in the air.
4. Turn the bag around to the opposite side and repeat step 3 with another pencil.
5. Take the third pencil and puncture the baggie in the center guiding the pencil directly through the water. Push the pencil through the water and puncture an exit hole through the center on the opposite side.

Data and Observations:

Record your observations in this space. What did you see? Anything you were not expecting? Did something really amazing? Describe it here.

Questions:

What will happen when a sealed, baggie-full of water is punctured by pencils?

Does the baggie leak water?

Does the baggie leak air?

References:

Steve Spangler Science: The Leak-Proof Bag Science

<http://www.stevespanglerscience.com/lab/experiments/leak-proof-bag> (accessed July 22, 2013).