Curiosity Guide #501
Polymers

Accompanies Curious Crew, Season 5, Episode 1 (#501)

Polymer Swell

Investigation #7

Description

Aren't polymers swell? You'll love discovering what this polymer can do!

Materials

- Polyvinyl alcohol
- Stove
- Measuring cup
- Food coloring
- Pot
- Clear dishes with lid
- Thermometer
- Digital scale
- Spoon
- Syringe

Procedure

1) Measure 5 grams of polyvinyl alcohol on a digital scale and set aside.
2) Measure and heat 100 milliliters of water in a pot on the stove to 80 degrees Celsius.
3) Slowly stir in the polyvinyl alcohol until dissolved.
4) Add a small amount of food coloring to the polyvinyl alcohol.
5) Remove from heat and set aside. Cover when cool.
6) Fill a large syringe with the colored polyvinyl solution.

7) Hold the syringe up over the polyvinyl dish and slowly press the solution out of the syringe.
8) What do you notice when the polyvinyl solution exits the tube? Why would the solution do that?

My Results

Explanation

When polymer molecule chains are in a relaxed state, they curl around kind of like a rubber band. However, when the molecule chains are forced to travel into the narrowing tube, they get straightened out under all that pressure. When the molecule chains exit the tube, they curl up again in their relaxed state. As a result, the polymer solution appears to swell larger than the opening it just left. This is called the Barus Effect.

Parents and Educators: use #CuriousCrew #CuriosityGuide to share what your Curious Crew learned!