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Educational Innovations Inc.®

Classroom Slime-Making Kit

SL-300

Materials Included

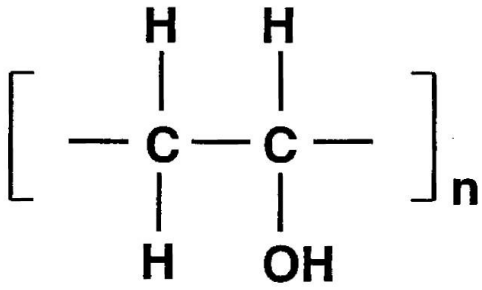
- 1 liter 4% polyvinyl solution
- 8 oz 4% sodium borate solution

Other Materials

- Scissors
- Food coloring (optional)

Explanation

Polyvinyl alcohol (PVOH) consists of a very long chain-like molecule called a polymer. The PVOH molecule is made up of repeating links called monomers. Each link in the PVOH chain looks like the following:



Poly(vinyl alcohol)

PVOH solution is viscous (thick) because all of these molecules stick to each other and to the water which surrounds them, just like a pot full of spaghetti.

When the sodium borate (borax) is added, the borax molecules form cross links between the PVOH polymers and connect many of the PVOH molecules together. The result is a new material which is even more viscous and has physical properties of both a solid and a liquid.

Because the bonds between the PVOH and the Borax consist of weak hydrogen bonds, the slime material is a visco-elastic gel and can flow like an extremely viscous liquid.

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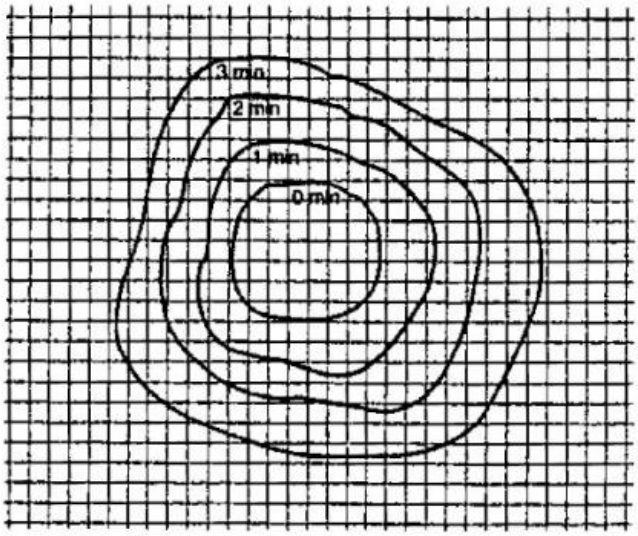
Slime Experiments

1. Place your slime onto a flat surface and observe that it flows like a liquid. Try stretching your slime into a very thin sheet by holding it in your fingers and carefully stretching it sideways as it flows down. Roll it, then pick it up and let it hang to make a very long slime snake.

2. Break your slime into two pieces and then hold the two pieces together. See how long it takes the two pieces to join together into one piece again.

3. Measure how fast your slime flows. Roll your slime into a ball and place it on a sheet of acetate. Use a marker to trace the shape of your slime onto the acetate. Trace it every minute or so and notice how it continues to flow outward... don't forget to mark each trace with the time. After a few minutes, remove your slime and place your acetate over a piece of graph paper. Calculate the area of each contour by counting the number of boxes within each tracing. Graph the area of each trace verses time to get a graph of the flow rate. Try taping the acetate to an inclined book or board to speed up the flow of the slime.



4. Try letting your slime dry out! Stretch your slime into a flat sheet and place it on a piece of plastic wrap. Let it dry for a couple of days, observing how it changes as the water it contains evaporates. Polyvinyl alcohol is a plastic, and as it dries it becomes hard and brittle.

5. Try to rehydrate your slime. After letting your slime completely dry out, add a tablespoon of water, and let it sit overnight. Notice once again how your slime changes.

NGSS Correlations

Our Classroom Slime Making Kit and these lesson ideas will support your students' understanding of these Next Generation Science Standards (NGSS):

Elementary

2-PS1-1
Students can use the Slime Making Kit to plan and conduct investigations to describe and classify kinds of materials by their observable properties.

5-PS1-3
Students can use the Slime Making Kit to make observations and measurements to identify materials based on their properties.

Middle School

MS-PS1-2
Students can use the Slime Making Kit to analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred.

MS-PS1-5
Students can use the Slime Making Kit as a model to describe how the total number of atoms does not change in a chemical reaction and thus mass is conserved.

High School

HS-PS1-7
Students can use the Slime Making Kit to 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.

HS-PS1-4
Students can use the Slime Making Kit to develop a model to illustrate that the release or absorption of energy from a chemical reaction system depends upon the changes in the total bond energy.

HS-PS1-7
Students can use the Slime Making Kit and then take it to a mathematical lesson to support the claim that atoms and mass are conserved during the chemical reaction.

Take Your Lesson Further

As science teachers ourselves, we know how much effort goes into preparing lessons. For us, "*Teachers Serving Teachers*" isn't just a slogan—it's our promise to you!

Please visit our website for more lesson ideas:

TeacherSource.com/lessons

Check our blog for classroom-tested teaching plans on dozens of topics:

http://blog.TeacherSource.com

To extend your lesson, consider these Educational Innovations products:

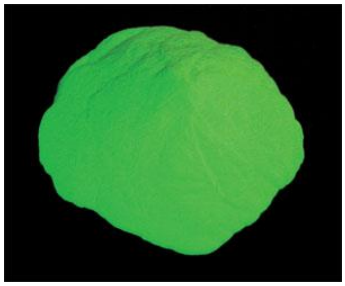
Super Cool Slime (SL-500)

We all know that slime's cool, but this slime is REALLY cool—literally! Each flask contains multi-colored, shimmery goo that breaks when you pull it apart, but also flows like a liquid. Ask students, why does it feel so cold? Is it a solid or a liquid? How do the colors remain separated, even after stirring? An awesome discrepant event demo that you can relate to many topics: heat energy, non-Newtonian fluids, polymers and so much more.

Polyvinyl Alcohol Bags (SM-8A)

These polyvinyl alcohol bags can be dissolved in hot water to make a polyvinyl alcohol solution. When combined with a borax solution, the polyvinyl alcohol polymer is cross-linked to form a fluid more commonly called SLIME! Simply dissolve one in about 2 cups of hot water to make the 4% polyvinyl alcohol solution necessary for slime.

Glow-in-the-Dark Pigment (GLO-100A)



This terrific pigment is used to make paint and other products glow in the dark. To make a super glowing paint, simply mix this non-toxic powder with Elmer's glue. The pigment can be activated by just about any light source including sunlight, fluorescent, incandescent, and ultraviolet light. Use our colored light sticks to demonstrate the pigment's greater sensitivity to blue light.