“Melt-A-Way”
Hot Water Soluble
Polyvinyl Alcohol Bags

SM-8A / SM-8B

Using these Polyvinyl Alcohol (PVOH) Bags in your lessons will support your students’ understanding of these Next Generation Science Standards (NGSS):

Elementary

5-PS1-3
Students can use PVA Solution in an investigation to make observations and measurements to identify materials based on their properties.

Middle School

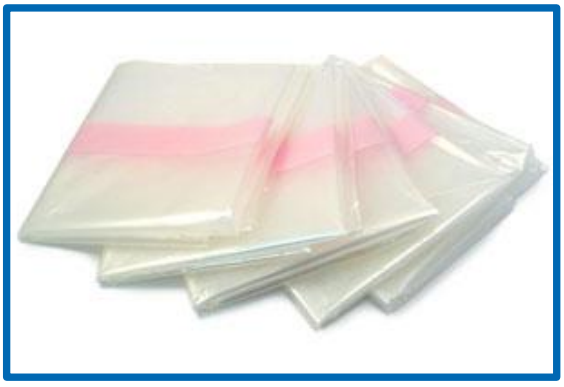
MS-PS1-3
Students can use PVA Solution in an investigation to analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred.

High School

HS-PS1-7
Students can use PVA Solution 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.

What Is Polyvinyl Alcohol (PVOH)?

Polyvinyl alcohol consists of very long chain-like polymers. PVOH is viscous (thick) because all of these molecules are tangled together, just like a pot full of spaghetti. When the Borax is added, the sodium tetraborate molecules connect many of the PVOH molecules together. The result is a new substance which is even more viscous, and which has the physical properties of both a solid and a liquid.



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5 Francis J. Clarke Circle
Bethel, CT 06801

Phone (203) 74-TEACH (83224)
Fax (203) 229-0740
www.TeacherSource.com

How to Make PVOH

Polyvinyl alcohol laundry bags are used in hospitals to minimize the contact hospital workers have with contaminated clothing and bedding. Dirty items are put into these special bags, which are then placed directly into the washing machine. Because polyvinyl alcohol is soluble in water, the bags dissolve and are washed down the drain with the dirty water. At the completion of the washing cycle, the clean clothes are removed from the washing machine.

Polyvinyl alcohol (PVOH) laundry bags can be dissolved in hot water to make a polyvinyl alcohol solution. When combined with a sodium tetraborate (Borax) solution, the polyvinyl alcohol polymer is cross-linked to form a viscous fluid more commonly called Gak™ or Slime! Simply dissolve one bag in about 16-18 fluid ounces of water to make the 4% polyvinyl alcohol solution necessary to make slime. Refer to the procedure below.

Materials

- Polyvinyl alcohol (PVOH) laundry bag
- Borax (sodium tetraborate), available from your local supermarket
- 2 containers for mixing
- Utensils for mixing
- Water (hot & cold)
- Food coloring (optional)

Procedure:

1. In a small container, dissolve one (1) PVOH bag in 16-18 ounces of hot water (the hotter the water, the faster the bag will dissolve. Do not, however, cook the PVOH solution. Mix with a stick or spoon until the PVOH is dissolved. Set aside and allow to cool to room temperature.

Hints:

You can dissolve more than one bag at once if you use more water!

A few drops of food coloring may be added at this point to give your slime some color.

If your bag does not dissolve completely, your water was probably not hot enough. You may continue even if there are still a few undissolved lumps remaining.

How to Make PVOH

(continued)

2. In another cup or bowl, make a saturated solution of Borax. Combine a small amount of Borax powder with water and stir. To make the solution saturated, continue to add Borax powder until there is a little on the bottom of the container that will not dissolve.

3. To make slime, add the Borax solution to the PVOH solution dropwise while stirring. Continue adding the Borax solution until the PVOH solution is no longer a liquid. Knowing just how much Borax solution to add is the trick to this experiment. If you add too little, your slime will contain excess PVOH and it will be sticky. Too much, and your slime will be excessively wet.

   Hints:

   If your slime feels sticky, try adding a little more Borax solution.
   If your slime feels very wet and slippery, remove it from the container and knead it. In a few minutes, the excess Borax solution will be absorbed.

4. Your slime is made of polyvinyl alcohol. If you leave it exposed to air for a long time (a few hours), it will begin to dry. Therefore, when you are not using it, you should story it in a plastic bag (zip-top bags work well), or other small container such as a plastic film canister.

5. As with any science experiment, your slime should not be consumed! Do not taste it or eat it, and do not leave it where a pet or young child might have access without supervision. (If your slime should become moldy, throw it away.)

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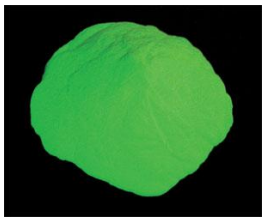

Glow in the Dark Pigment (GLO-100A)

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.

Classroom Slime Kit (SL-300)

Everyone enjoys making slime!!! Can be colored using food dyes. This class slime kit contains: 1 liter of colorless 4% polyvinyl alcohol, enough 4% sodium tetraborate solution to cross-link with it. A food preservative has been added to avoid the growth of unwanted creatures.

Goldenrod Color-Changing Paper (SM-925)

True goldenrod paper is made from a dye which is an acid-base indicator. This paper turns bright red in bases such as ammonia, baking soda or washing soda and returns to bright yellow in acids such as vinegar or lemon juice.

Alginate Worm Kit (CK-600)

Make colorful, worm-like gels by combining two solutions; sodium alginate from seaweed and the salt, calcium chloride. The calcium ions from the salt loosely bind the polymer alginate chains into a gel.