

Carolina™ Solution Sheets

# Polyvinyl Alcohol

Learn how to make polyvinyl alcohol solution and use it to make slime.

## Materials

Polyvinyl Alcohol (item #882370)  
Glass Beaker (item #731009)  
Stir Bar  
Magnetic Stir Plate (item #701023)  
Graduated Cylinder (item #721744)  
Label

### Don't want to make it yourself?

Find PVA solution at Carolina.com

#### Item Numbers

882372, 882373, 882371

## Procedure

**Note:** Use 4.2 g of PVA powder for every 100 mL of water.

1. Fill a large glass container (beaker or Erlenmeyer flask) half-full with tap water on a stirrer/hot plate (e.g., if you have a 200-mL container, fill with 100 mL of water). If available, begin with hot tap water.
2. Place a magnetic stir bar to the container and heat the tap water to just below boiling (80 to 90° C).
3. Slowly sprinkle the correct amount of PVA powder in small increments while stirring. **Note:** Adding the powder in large increments or without stirring will result in a sticky mass that is difficult to dissolve.
4. Maintain temperature just below boiling and continue stirring for 20 minutes. PVA may not completely hydrolyze and/or may not completely dissolve. The solution may contain small white clumps of PVA powder.
5. **Allow the mixture to sit overnight.** After sitting overnight, PVA should completely hydrolyze but may not completely dissolve. The solution may contain clear lumps of hydrolyzed PVA.
6. Stir the solution on a stirrer/hot plate until clear PVA lumps have completely dissolved.
7. Remove magnetic stir bar.
8. Store solution in a closed, labeled container.

## Notes

- Polyvinyl alcohol is prepared by an initial polymerization reaction of vinyl acetate. This polymer is subsequently converted to polyvinyl alcohol.

## Label Information

Polyvinyl Alcohol, 4%

Date Prepared: \_\_\_\_\_

Initials of Preparer: \_\_\_\_\_

Health Risk: 0

Flammability: 0

Reactivity: 0

## Applications

In industry, polyvinyl alcohol is used in papermaking, textiles, and a variety of coatings. It is white (colorless) and odorless. It is sometimes supplied as beads or as solutions in water because of its emulsifying and adhesive characteristics.

To make slime using 4% PVA, combine 50 mL of 4% PVA with 5 mL of 4% sodium borate solution (borax) and stir until gelled. Food coloring can be added for visual appeal. Store in an airtight plastic bag. The slime will keep up to a week before beginning to mold.

## Reference

Hallensleben, Manfred L. 2000. Polyvinyl compounds, others. In vol. 29, *Ullmann's encyclopedia of industrial chemistry*, ed. Barbara Elvers. Weinheim, Germany: Wiley-VCH. DOI:10.1002/14356007.a21\_743.