



## Fiber Formation from PET Soda Bottles

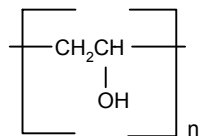
Recycled soda bottles, of poly(ethylene terephthalate) PETE or PET, are made into fiberfill for jackets and sleeping bags as well as into carpeting. To demonstrate how a fiber can be made, cut part of a bottle into small (one centimeter) pieces. Place 8-10 pieces in an aluminum foil “pan” on a hot plate. Heat the sample slowly until it melts but do not let the pieces become discolored. Insert the tip of a wooden splint into the sample and hold it in the molten polymer for a few seconds. Slowly pull the splint away at a constant speed. Try to produce a long fiber. Place it on the counter top to cool and then test it for elasticity.

*Written by Mary Harris, Missouri Polymer Ambassador  
With contributions from Marie Sherman, Missouri Polymer Ambassador*

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## Ram Extrusion of PVA

Fibers are generally made by pushing a melt through little holes called “spinnerets”. This can be simulated with liquid polyvinyl alcohol and a syringe. Prepare a 5% by weight PVA, poly(vinyl alcohol), solution with water (5 grams PVA in 95 grams water). Put the solution on a magnetic stirrer on a hot plate and gradually heat until the solution becomes clear and no lumps are visible. This should occur below 80° C. Cool the solution to room temperature. Place the solution in a 10 mL plastic syringe and extrude it through a No. 20 or 24 needle into a glass Petri dish of acetone. This can be done on an overhead projector so your students can see the fiber being extruded. Remove the fiber with forceps and test its flexibility. It will harden if left in acetone. It can be dried in air to form a rigid fiber. If water is added to the rigid fiber, the fiber becomes more elastic because the water acts as a plasticizing agent. This is not a polymerization reaction. It is dehydration of strands of polyvinyl alcohol pulled from the acetone.



*Contributed by Marie Sherman, Missouri Polymer Ambassador*

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