

## Formation of a Polyurethane Polymer

### Instructions

#### Materials:

Polyurethane foam 2 part system kit\* (Part A & Part B)

2 smaller beakers

1 large beaker or clear cup

Stirring rod

Newspaper

\*The polyurethane kit can be found in crafts stores or ordered from Flinn Scientific Inc.

#### Set Up:

1. Pour equal volume of the two liquids into two beakers or clear cups. Part A is a cream colored viscous liquid. Part B is a dark brown viscous liquid.
2. Place a large beaker or clear cup on top of a sheet of newspaper. This protects the table top surface. Its not easy to clean the beaker so it may be better to use a large disposable cup in your classroom.

#### Demo Procedure:

1. Point out to the students that the two separate liquids contain the monomers that will link together, or polymerize, to form the polyurethane polymers.
2. Pour the two liquids into one large beaker and stir with the stirring rod.
3. When the polymerization process starts, you will observe a mixture rising from the bottom of the beaker. There is also visible gas and heat being released by the reaction.
4. The foam will expand to the top of the beaker, sometimes it may even spill over.
5. Try no to touch the soft foam. As the foam cools it will harden into a hard plastic. When its completely cooled the polyurethane plastic can be passed around safely and displayed in your classroom.

#### Reference:

Shakashiri, B. Z. Chemical Demonstrations : A Handbook for Teachers of Chemistry; University of Wisconsin: Madison, 1983; Vol. 1, pp. 216-218.