

Polarity with Paper Punches

Instructions

Materials:

Paper

Colored wax pencil, red and black colors

Nonpolar solvents: carbon tetrachloride (CCl_4) or mineral oil

Polar solvent: water

Blue food coloring

2 glass jars

Set Up:

1. Color one area of the paper heavily with the red wax pencil, using a hole-puncher punch out round discs of the paper. One side should be white (polar paper side) while the other side is red (nonpolar wax side)
2. Color one area of the paper heavily with black wax pencil, using a hole-puncher punch out round discs of the paper. One side should be white (polar paper side) while the other side is black (nonpolar wax side)
3. Add blue food coloring to water.
4. Pour the colored water into two jars.

Demo Procedure:

1. Pour carbon tetrachloride into the first jar. Point out that the clear organic solvent, denser than water, sinks below the blue water.
2. Pour mineral oil into the second jar. Point out that the clear organic solvent, less dense than water, floats above the blue water.
3. Add the black paper discs into the first jar. Shake the jar. Observe that the discs with the black nonpolar side face down toward the nonpolar carbon tetrachloride solvent.
4. Add the red paper discs into the second jar. Shake the jar. Observe that the discs with the red nonpolar side face up toward the nonpolar mineral oil layer.
5. Point out that in both jars, the white paper side of the discs orient toward the polar water layer.