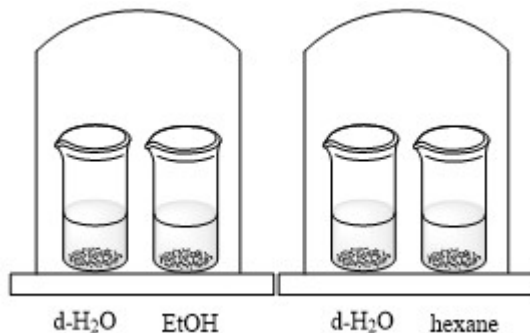


Miscible vs. Immiscible Liquids

Just like salad dressing, but don't eat it

Chemicals and Equipment Needed

- d-H₂O
- Hexanes – **R2/R4**
 - Use the “used hexanes” bottle when possible
- 95% ethanol – **R2**
- food coloring – **U1**
- 4-300 mL beakers – **Q2**
- 2 glass rods – **U1**
- 4 petri dish lids – **P3**
- 2 white backgrounds – **A1**



Hazards

- Both hexane and ethanol are volatile, flammable organic solvents. Take care to keep the bottles away from open flames.
- Hexane is a respiratory irritant. Wear goggles and gloves when handling hexane, and pour the solvent in a chemical fume hood or a well-ventilated area. If skin exposure occurs, wash area with soap and water.

Preparation

- Wait to pour the ethanol or hexane until shortly before class.
- Measure out 75 mL of d-H₂O into two beakers and add one drop of (same color) food coloring to each beaker. (use the lines on the beaker)
- Label one beaker and lid as **d-H₂O Add Hexane**, and the other set as **d-H₂O Add Ethanol**. Measure out 75 mL hexanes in one beaker, 75 mL EtOH into the other.
 - Just use the lines on the beaker to measure. This ain't the Precision Olympics.
- Set up the white backgrounds side by side. In front of each background, place a beaker of d-H₂O and a beaker of organic solvent. Put the glass rods nearby.

Presentation

- Ask the students to define the terms **miscible** and **immiscible**.
- Ask the students to list the most important intermolecular forces for each substance:
 - Water – hydrogen bonding
 - Ethanol - hydrogen bonding
 - Hexane – London dispersion
- Ask the students to predict what will happen when you add water to ethanol, then perform the demo to show that they mix. Ask them what will happen when you add water to hexane, then perform the demo and show that the liquids layer
 - Ask them which one is floating on top and why.

Clean-Up

- Pour the colored EtOH/ H₂O solution into organic waste. Pour the hexane/ H₂O mixture into a separation funnel (**J5**). Drain the water into a beaker and then pour down the drain. Drain the hexane into the bottle labeled “Used Hexanes”

NOTES: We used to offer an extension of this demo with octanol, but it is stinky and also we ran out.