

Disappearing Volume from a Mixture

Instructions

Materials:

Methanol

Ethanol

Water

Blue food coloring

6 100-mL volumetric flasks

3 200-mL volumetric flasks

Paper clips

Set Up:

1. Set up 3 pairs of 100-mL flasks with the following liquids:
 - A: 100 mL water & 100 mL water
 - B: 100 mL water & 100 mL methanol
 - C: 100 mL water & 100 mL ethanol
2. Set out 3 empty 200-mL flasks each with a glass funnel
3. Optional: As demonstrated in the video, you can hang a paper clip on the edge of the 200-mL flask so that the glass funnel sits slightly above the lip of the flask, this will allow the liquids to drain more smoothly into the flask.

Demo Procedure:

1. Add 1 drop of food coloring to the water in all 4 100-mL flasks. This will allow you to see the combined volume better.
2. Hang a paper clip on the edge of the 200-mL flask then place the glass funnel on top of the flask.
3. Start with group A solutions, pour the first 100mL water into the larger flask and then add the second 100mL of water. Point out that the combined water volume is 200 mL.
4. Repeat with group B solutions, pour the first 100mL water into the larger flask and then add the second 100mL methanol portion.
5. Repeat with group C solutions, pour the first 100mL water into the larger flask and then add the second 100mL ethanol portion.
6. Point out that Group B and C solutions have combined volumes that do not add up to 200mL and are visibly lower in volume than Group A (adding two volumes of water).