

Student guide: Making an Emulsion



Overview and objective:

This activity illustrates the properties of certain molecules and how these molecules interact.



Major concepts:

Substances like oil and water do not mix well because oil is hydrophobic (water-repelling), meaning it does not easily mix with polar or charged substances. Water is a polar molecule because it has both positively and negatively charged ends. Since only opposites attract, the positive and negative ends of the water molecules stick together.

Emulsions are created when a compound called an emulsifier is added to substances that normally wouldn't mix. Oil and water can be combined to create an emulsion when soap is added. Soap acts as an emulsifier because a soap molecule has both a hydrophobic (water-repelling) and hydrophilic (water-attracting) end. Each end will attract either polar or non-polar molecules, creating an emulsion.

Without emulsions, we would not have mayonnaise, several cosmetic products or even ice cream? For example, when cooking, an egg yolk is added to make two substances that do not want to mix, like oil and vinegar, combine and create foods we enjoy. Milk is a natural emulsion between milkfats and water. This experiment will demonstrate how to create an emulsion.



Safety guidelines:

Safety glasses and gloves are required for this experiments.



Materials required:

- 15 mL Conical tube with lid
- Wooden stirrer or plastic spoon
- 7 mL water
- Food coloring
- 7 mL vegetable oil
- Dish soap
- Measuring tool for teaspoons



Procedure:

Creating an Emulsion

- 1.Fill the conical tube with 7mL of water. Add a few drops of food coloring and stir.
- 2.Pour 7mL of oil into the conical where you have already added water.
- 3.Securely tighten the lid on the conical and shake it for 20 seconds.
- 4.Set the conical down in rack and observe how the oil and water interact.
- 5.Remove the lid and add 1 teaspoon of dish soap to the jar or bottle.
- 6.Tighten the lid back on the conical and shake again for another 20 seconds.
- 7.Set the conical down in the rack and observe how the oil and water interact after the soap has been added.

