

Inquiry Question

Suspensions and emulsions – why does my salad dressing separate into layers and is it possible to prevent this?

Name: _____ Date: _____



Suspensions are mixtures that have solid or liquid particles scattered around in a liquid or gas, such as raw milk, salad dressing, fresh squeezed orange juice and muddy water. If left undisturbed, the solids or liquids that are in the suspension may settle out and form layers, like the layering in salad dressing after it has been left to rest.

Colloids are different from a suspension because the dispersed particles are very small and will not separate into layers like a suspension. These particles are bigger than molecules but are still too small to see. Emulsions are a form of colloid in which a liquid is dispersed in another liquid that acts as the continuous phase. Often an emulsifying agent is needed to produce an emulsion. These emulsifying agents are molecules that can surround the dispersed particles and make a layer around them to keep them separated from the continuous phase and each other. Emulsifiers are used to stabilize many food products. When we wash dishes, the dish detergent emulsifies the grease on dishes and suspends it as tiny particles in the dish water and keeps it off the dishes.

In this project you will be mixing a suspension and allowing it to separate. You will then look at the effect of an emulsifying agent in stabilizing the suspension. This lab requires follow-up the next day so make sure to plan your schedule accordingly.

General Instructions

The goal of this project is to learn about the properties of suspensions and emulsions.

Materials you'll need:

- Cooking oil
- Vinegar
- Mason jar or other jar with a tight lid.
- Dishwashing liquid
- Timer with seconds

Ideas and Hints:

Instructions:

- Place a small but equal amount of both liquids into the jar. Half a cup of each is plenty.
- Shake the jar and record the time for the liquids to separate.
- Shake the jar harder and record the time for the liquids to separate.
- Shake the jar longer and record the time for the liquids to separate.
- Add two drops of dishwashing liquid to the suspension.
- Shake the jar and record the time for the liquids to separate.
- Let the mixture sit overnight.

Construct a table that includes what you did each time you mixed the suspension and a place to record the time it took to separate. Record your procedures and observed times for separation in this table.

Then answer the following questions.

1. In this activity, which material acted as the emulsifying agent?
2. How does an emulsifying agent work?
3. Were you able to keep the oil and vinegar separated or create a stable emulsion?
4. Many foods contain emulsifiers. What would happen if these agents were not added to these food products?
5. Name a food product or personal care product that contains an emulsifying agent. What is the emulsifying agent called?

Project submission:

You can either submit this table along with the answers to the questions or if you can drop in to the school, you can present these to your teacher in-person. Be sure to carefully organize any data collected so that any other student or teacher could reproduce your experiment and achieve the same results.