California State University of Bakersfield, Department of Chemistry

Emulsion

Standards:

HS-PS1-2. Construct and revise an explanation for the outcome of a simple chemical reaction based on the outermost electron states of atoms, trends in the periodic table, and knowledge of the patterns of chemical properties.

Introduction:

Under normal conditions, there are certain liquids that just do not mix. For example, oil and vinegar are two liquids that repel each other due to differences in polarity and density. However, with the assistance of a substance known as an emulsifier, it is possible to force them to mix!

Materials:

- 1½ cup vinegar
- 1½ cup vegetable oil
- 3 jars with lids (that hold approximately 1 cup of liquid each)
- 3 tbsp. egg yolk (this required the yolk of 3 eggs)

Safety:

- Always have an adult with you to help you during your experiment.

- Always wear eye protection and gloves when doing chemistry experiments
- Wash your hands properly after handling raw eggs.

Procedure:

1. In each jar, add ½ cup vegetable oil.
2. Next, add ½ cup vinegar to each jar. Optimally, the jars will be nearly full at this point.
3. To one jar, add 1 tbsp. egg yolk and put the lid on the jar. To a second jar, add 2 tbsp. egg yolk and put the lid on the jar. On the third jar, do not add any egg and simply put the lid on.
4. Rapidly shake each jar for 15 – 30 seconds and place them back on the table.

Data and Observations:

Record your observations in this space

Questions:

1. Why do you think that oil and vinegar do not mix?

2. What did you see take place in the jars with egg in them?

References:

1. Oil and Vinegar Do Mix… When You Have An Emulsifier. Science Buddies. Dec 7, 2013. http://www.sciencebuddies.org/science-fair-projects/project_ideas/FoodSci_p021.shtml (accessed July 31, 2013).