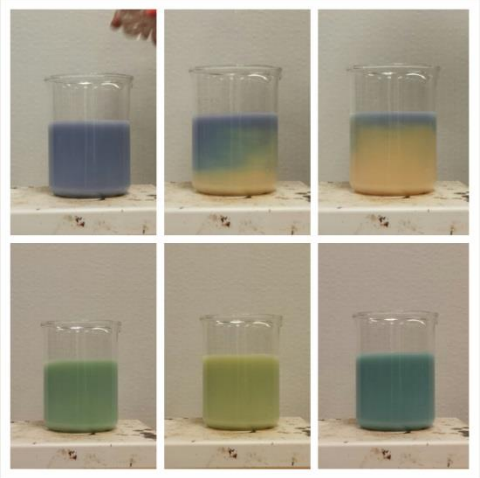
California State University of Bakersfield, Department of Chemistry

Magic Milk of Magnesia



Standards:

2-PS1-1. Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties.

2-PS1-3. Make observations to construct an evidence-based account of how an object made of pieces can be disassembled and made into a new object.

Introduction:

Have you ever had heartburn and taken products like Milk Magnesia to settle your stomach and wondered how those antacids really work? This highly visual demonstration uses cool color changing chemistry to show you exactly how Milk of Magnesia neutralizes the acids in your stomach.

Materials:

- Milk Magnesia (Make sure the primary ingredient is magnesium hydroxide Mg(OH)2)
- Universal Indicator (Cabbage Juice Indicator will work in place, but the color change is not as dramatic)
- Vinegar
- Magnetic stirring bar and stirring plate

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Safety:

- Always have an adult with you to help you during your experiment.
- Always wear eye protection and gloves when doing chemistry experiments

Procedure:

1. Place about 100 mL of Milk of Magnesia into a 500 mL Beaker and dilute with tap water until the beaker is about half full.
2. Add about 10 mL of Universal Indicator (this will provide a sharp color change and will turn red on the far acidic end of the scale and dark blue on the alkaline side)
3. Use the magnetic stirrer to create a steady mix of the liquids. If you don't have a magnetic stirrer, simply stir it by hand. You'll see that the solution turns a light blue, indicating that it is slightly basic due to the small amount of the $Mg(OH)_2$.
4. While stirring the solution, add 10-20 mL of vinegar and observe the rapid color change. The mixture quickly changes to red because the acid disperses throughout the beaker.
5. The acid neutralizes the small amount of hydroxide ion from the $Mg(OH)_2$ that has dissolved first, then turns the solution acidic. However, as more of the $Mg(OH)_2$ from the suspensions gradually dissolves into solution, the acid is neutralized and eventually the solution becomes basic.
6. If you want to see it again, add more vinegar and watch as the liquid goes from red to orange to yellow to green and eventually settles at the bluish-purple color.
7. In time, all of the vinegar (acid) will react with the magnesium hydroxide and the solution will remain red.

Data and Observations:

1. Record your observations in this space.

Questions:

2. Why does the solution change colors?

References:

1. Spangler, Steve. Color Changing Milk of Magnesia. http://www.stevespanglerscience.com/search/experiment?q=color-changing-milk-of-magnesia (Accessed: July 28, 2014).

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