

Samples: home experiments

Chemistry Celebration Weekend

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University of Wisconsin Madison

Science is Fun: Household Chemicals ***presented by the*** ***Wisconsin Initiative for Science Literacy***

MAKING A FOAM

A foam is a collection of tiny bubbles. Bubbles are gas trapped inside a liquid or a solid. To make a foam we need to make a gas, and we need to trap it. We will make carbon dioxide gas by the reaction between baking soda and vinegar. We will trap the carbon dioxide in liquid dish detergent, which makes a film around the gas.

MATERIALS

- baking soda
- vinegar
- dish detergent
- tall drinking glass
- tablespoon measure
- spoon
- half-cup measure

PROCEDURE

Put a tablespoon of baking soda into the drinking glass. Add about the same amount of dish detergent. Stir the mixture until it is uniform. Place the glass in a sink or on a waterproof tray. Pour a half cup of vinegar into the glass. The vinegar reacts with the baking soda, generating carbon dioxide gas. So the mixture begins to fizz. As it fizzes, it will make a foam that fills the glass. It may even overflow the glass, which is why we put it on a tray!

PUTTING OUT A CANDLE

Vinegar reacts with baking soda and they form carbon dioxide gas. Carbon dioxide gas does not support combustion, so it puts out flames. This is why carbon dioxide is used in some fire extinguishers. We will generate some carbon dioxide and watch it put out a flame.

MATERIALS

- 600-mL beaker or similar container
- about $\frac{1}{2}$ cup of vinegar
- about a tablespoon of baking soda
- a short candle
- matches or lighter

PROCEDURE

Set the candle inside the beaker. (The candle should be no more than half the height of the beaker, so it is completely inside the beaker.) Pour vinegar into the beaker to a depth of about a quarter of a way up the candle. (Too much vinegar may cause the candle to float and fall over.) Light the candle. Sprinkle about a tablespoon of baking soda onto the vinegar around the candle. The mixture will immediately begin to fizz as carbon dioxide gas is formed. As the carbon dioxide gas fills the beaker, it will eventually reach the flame and put it out.

MAKING A CANDLE BRIGHTER

When a candle burns, it uses oxygen from the air. If the oxygen is removed, the candle goes out. If the amount of oxygen is increased, the flame will get brighter. We can make oxygen gas from hydrogen peroxide. Hydrogen peroxide decomposes to oxygen gas and water. The decomposition is usually very slow. But there are some catalysts that make the decomposition faster. One of these catalysts is an enzyme in yeast.

MATERIALS

- 600-mL beaker or similar container
- a short candle
- 3% hydrogen peroxide solution
- yeast
- matches or lighter

PROCEDURE

Set the candle inside the beaker. (The candle should be no more than half the height of the beaker, so it is completely inside the beaker.) Pour 3% hydrogen peroxide into the beaker to a depth of about a quarter of a way up the candle. (Too much hydrogen peroxide may cause the candle to float and fall over.) Light the candle. Sprinkle about a half teaspoon of powdered yeast onto the hydrogen peroxide around the candle. The mixture will begin to fizz as oxygen gas is formed. As the oxygen gas fills the beaker, it will eventually reach the flame and the flame will become brighter.

DANCING RAISINS

Normally raisins don't float in water. But if they can collect some gas bubbles, then they will float to the surface and release their bubbles. After releasing the bubbles, they sink again. When this happens, the raisins look as though they were dancing. We can get raisins to dance this way by generating a gas in the water. We will do this with baking soda and vinegar, which make carbon dioxide gas.

MATERIALS

- tall 12-ounce drinking glass
- water
- a tablespoon of baking soda
- 1/4 cup vinegar

PROCEDURE

Put 1/4 cup of vinegar into the glass. Add water until the glass is about 3/4 full. Add a tablespoon of baking soda and give it a stir. Drop in several raisins and watch them begin to dance. See if you can observe the gas bubbles that make the raisins dance.

PECULIAR PUTTY

Solids are stiff and stay where you put them. Liquids are fluid and run away. Then some things can be stiff or fluid depending on what you do with them. This peculiar putty is such a strange thing.

MATERIALS

1/2 cup dry cornstarch
1/4 cup water
bowl

PROCEDURE

Put 1/2 cup of cornstarch into the bowl. Add 1/4 cup of water slowly, mixing the cornstarch and water with your fingers until all the powder is wet. Keep adding the water until the mixture feels like a liquid when you mix it slowly. Tip the bowl and the putty will run. Put down the bowl and tap on the surface of the putty. It will feel solid. If the putty is still powdery, add little more water. If it is too watery, add a little more cornstarch.

Now, play with your peculiar putty. Pick it up in your hand and squeeze it. It feels hard. Stop squeezing and open your hand. The putty will begin to run and drip through your fingers. Put your putty back in the bowl. Rest your finger on the surface and slowly push down. Your finger will sink in. When your finger reaches the bottom of the bowl, pull it out quickly. What happens to the putty?

**Check out the Science is Fun Web site at:
www.scifun.org**