

Controlling the Amounts of Product in a Chemical Reaction - Activity Sheet

Objectives:

1. Students will be able to explain that for a chemical reaction to take place, the bonds between atoms in the reactants are broken, the atoms rearrange and new bonds between the atoms are formed to make the products.

2. _____

3. To be able to explain that the equal number of atoms on each side of the equation shows that mass is conserved during a chemical reaction.

4. To be able to explain, on the molecular level, why _____

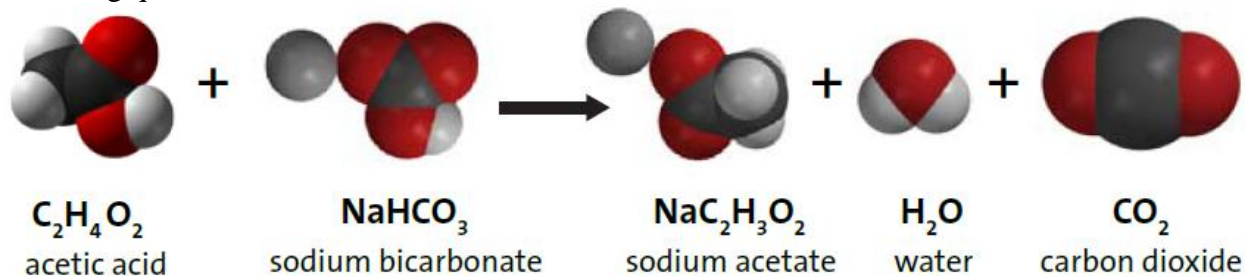
DEMONSTRATION

1. Your teacher combined a liquid (vinegar) and a solid (baking soda). You observed bubbling, which is made from gas. Do you think a chemical reaction occurred?

Why?



2. Look at the chemical equation for the reaction between vinegar and baking soda to answer the following questions.



What are the *reactants* in this chemical reaction? What are the *products* in this chemical reaction?

ACTIVITY

Question to investigate

How can you make just the right amount of foam that rises to the top of the graduated cylinder without overflowing?

Procedure

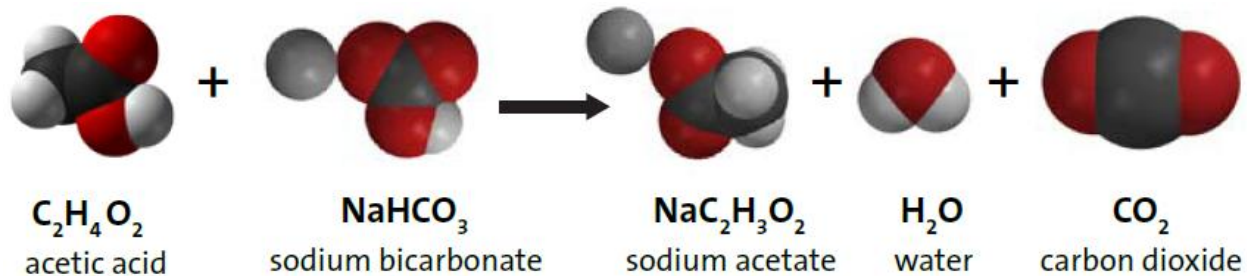
1. Decide on how much vinegar and baking soda you will use and write these amounts in the chart on the activity sheet.
2. Use a graduated cylinder to measure the amount of vinegar your group agreed on.
3. Pour the vinegar in a small cup and add 1 drop of detergent. Swirl gently to mix.
4. Add the amount of baking soda your group agreed on to the empty graduated cylinder.
5. Place the graduated cylinder in a plastic waste container.
6. Pour the vinegar and detergent from the cup into the graduated cylinder. Observe the level of foam in the graduated cylinder.
7. Rinse the graduated cylinder over the waste container.



Adjust the amounts of baking soda and vinegar to create just enough foam to rise to the top of the graduated cylinder without overflowing.

	Demonstration	First try	Second try	Third try
Vinegar	10 mL			
Baking soda	½ teaspoon			
Detergent	1 drop	1 drop	1 drop	1 drop
How close did the foam get to the top of the cylinder?	Overflowed			

EXPLAIN IT WITH ATOMS & MOLECULES



3. Why, on a molecular level, does changing the amount of baking soda or vinegar affect the amount of carbon dioxide gas produced?

4. What would you do if you wanted to make more carbon dioxide?

5. Could you just keep adding more and more baking soda to the same amount of vinegar to get more carbon dioxide?

Why or why not?