



Baking Soda Balloons

Georgia Standards of Excellence

S2P1. Obtain, evaluate, and communicate information about the properties of matter and changes that occur in objects.

a. Ask questions to describe and classify different objects according to their physical properties. (Clarification statement: Examples of physical properties could include color, mass, length, texture, hardness, strength, absorbency, and flexibility.)

b. Construct an explanation for how structures made from small pieces (linking cubes, building blocks) can be disassembled and then rearranged to make new and different structures.

c. Provide evidence from observations to construct an explanation that some changes in matter caused by heating or cooling can be reversed and some changes are irreversible. (Clarification statement: Changes in matter could include heating or freezing of water, baking a cake, boiling an egg.)

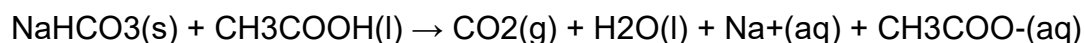
S8P1. Obtain, evaluate, and communicate information about the structure and properties of matter.

f. Construct an explanation based on evidence to describe conservation of matter in a chemical reaction including the resulting differences between products and reactants. (Clarification statement: Evidence could include models such as balanced chemical equations.)

Discussion:

The reaction between baking soda and vinegar actually occurs in two steps, but the overall process can be summarized by the following word equation: baking soda (sodium bicarbonate) plus vinegar (acetic acid) yields carbon dioxide plus water plus sodium ion plus acetate ion

The chemical equation for the overall reaction is:



with s = solid, l = liquid, g = gas, aq = aqueous or in water solution

Another common way to write this reaction is:



The above reaction, while technically correct, does not account for the dissociation of the sodium acetate in water.

Objectives: Students will observe a reaction that produces gas.

Materials Needed:

- Vinegar
- Baking soda
- A drink bottle
- Balloon

Procedure:

1. Place the vinegar in the bottle.
2. Place some baking soda in a balloon.
3. Place the balloon on the mouth of the bottle making sure not to spill the baking soda.
4. Turn up the balloon so the baking soda spills into the vinegar.
5. Watch what happens



Further Investigation:

What happens if you add more baking soda after the first balloon is filled?

Try seeing if the gas that is generated will react with a lit candle.

Is the gas made in the balloon lighter or heavier than air, how could you find out?

