What Makes Baking Soda & Vinegar React to Each other?

This popular experiment is performed by students and classrooms more than any other experiment. It’s very easy to do and requires only two chemicals; which can be found in mostly any household. When these two chemicals are mixed, it causes a reaction of popping, fizzing, and crackling. This experiment is not dangerous, but supervision is needed if children are doing it. To understand the process of what happens, it’s important to understand the ingredients used. As this experiment takes place, an explanation of what is happening should also take place.

**Vinegar and Baking Soda**

Vinegar is a non-toxic chemical made of water, salt, and something called acetic acid. Normal white vinegar contains five percent acetic acid. This acid, when mixed with sodium bicarbonate causes a fizzing and bubbling reaction. Baking soda is a chemical that contains several ingredients, one of which is sodium bicarbonate. The sodium bicarbonate when mixed with other chemicals, such as acetic acid, causes visible reactions.

**Carbonic Acid and Carbon Dioxide**

When baking soda is mixed with vinegar, a reaction takes place. The two chemicals, acetic acid and sodium bicarbonate, do not mix with each other; therefore causing a reaction. When the two chemicals are mixed, a new chemical is formed called carbonic acid. This chemical is very unstable and therefore it instantly starts falling apart and it turns into carbon dioxide and water. When the acetic acid and sodium bicarbonate meet, the carbonic acid is produced. It then falls apart thus leaving only carbon dioxide and water remaining. Bubbles begin floating around the top of the experiment. The bubbles, produced by this reaction, are actually the carbon dioxide escaping. Carbon dioxide is a gas and therefore does not mix with water. The carbon dioxide escapes from the water through the bubbles. Carbon dioxide is the air we exhale when we breathe.

**Sodium Acetate**

After all of the carbon dioxide escapes; the mixture suddenly stops bubbling, popping, and crackling. This happens because the carbon dioxide is what caused the reaction and once the carbon dioxide is gone, the reaction stops. After it stops, all that is left in the glass is sodium acetate and water.

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