Curiosity Guide #503
Rocks

Accompanies Curious Crew, Season 5, Episode 3 (#503)

Dissolving Rocks

Investigation #5

Description

How do you dissolve a rock? This seems like magic, but it's just good old science. Isn't science amazing?

Materials

- 2 clear containers
- Water
- Vinegar
- 2 pieces of white chalk

Procedure

1) Fill one container with water.
2) Fill the second container with an equal amount of vinegar.
3) Place a piece of chalk in each container and observe.
4) What happens?
5) After an hour pour off the liquids from each container and compare the chalk from each container.
6) How do what is left in the two containers compare? Are there sediments left behind in the containers?

My Results

Explanation

Chalk is a sedimentary rock made of calcium carbonate. Chalk immediately begins to dissolve when it comes in contact with an acid like vinegar. In contrast, the chalk that is in water has no such reaction.

Rocks that contain calcium carbonate can erode when they come in contact with acids, and chalk contains calcium carbonate. Vinegar is acetic acid, and chalk is a base. An acid plus a base causes a chemical reaction. So, vinegar combined with chalk creates a chemical reaction.

When acids and bases combine, they produce water and salts. Putting the chalk in the vinegar starts the chemical reaction as the acid starts to dissolve the calcium carbonate. We can see the release of carbon dioxide bubbles that fizz upward, and in time the vinegar becomes water. A calcium salt called calcium acetate is created. The calcium salt is left behind as particles in the bottom of the container. Something similar happens in nature, when the carbon dioxide in the air increases the acidity of rain and erodes rocks. Of course, this natural chemical reaction happens MUCH more slowly!

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