



Fizzy Fossils

What you need

- Protective glasses
- Clear glass bowl
- White distilled vinegar (about 2-3 cups)
- Magnifying glass
- Samples of fossiliferous limestone
- Cloth towels

Follow the steps below to explore the chemical composition of fossiliferous limestone!



Preparation

1. Gather samples of fossiliferous limestone. In eastern Kansas, you can often find fossiliferous limestone around your home or neighborhood. You can also order a rock “grab bag” online and use the limestone included in the bag for this experiment.
2. Place some cloth towels down on your work surface in case of splashing or spills.
3. Wear the glasses to protect your eyes.
4. Pour the vinegar into the clear glass bowl (about half full).
5. Make a prediction: What do you think will happen when you place the limestone into the bowl of vinegar?

What to do

1. Place the limestone into the bowl of vinegar.
2. Wait several minutes and, using your magnifying glass, observe the reaction that occurs.
3. Note the fizzing and the bubbles being released.

What is happening?

Fossiliferous limestone is a sedimentary rock composed of lithified (compacted and cemented) particles and preserved shells or other animal parts. In eastern Kansas, these limestones date primarily to the Carboniferous Period (over 300 million years old) and preserve the fossils of invertebrate organisms such as brachiopods, crinoids, single-celled protists called foraminifera, and more. During the fossilization process, the organisms’ original shell composition (usually the soft calcium carbonate mineral aragonite) gets recrystallized as the harder calcium carbonate mineral calcite. Along with calcium carbonate rich mud and silt, the fossils get compacted and cemented together, forming rock layers.

Rocks that contain calcium carbonate can erode when they encounter acids, and as we’ve established above, limestone is a calcium carbonate rock. Vinegar is an acid and limestone is a base. An acid plus a base causes a chemical reaction. When acids and bases combine, they produce water, gas, and salts as products. As the acid starts to dissolve the calcium carbonate of the limestone, we can see the release of carbon dioxide bubbles that fizz upward. Over time as the vinegar slowly becomes water, a calcium salt called ‘calcium acetate’ precipitates out. The salt is left behind as particles on the bottom of the container. Testing different rocks to see if they fizz or not will show you if those rocks contains calcium carbonate.