

Popcorn Rock

Overview: Popcorn rocks, or flowering rocks, are dolomite samples that grow aragonite crystals when you place them in distilled white vinegar. The crystals will grow overnight, and flourish in about a week.

What to Learn: Popcorn rocks are different than regular dolomite samples because they have a lot more magnesium inside. This was first discovered by a geology professor in the 1980s who was dissolving the limestone around fossils he was studying in his rock samples. When he placed samples of this type in the acid to dissolve, it didn't dissolve but instead grew new crystals!

Materials

- “Flowering Rock” dolomite samples
- Distilled white vinegar (acetic acid)
- Disposable cup or glass jar
- Penny
- Nail
- Streak plate
- Water in a graduated container
- Scale that measures in grams
- Longwave UV light source
- Sunlight

Experiment

1. You're first going to classify dolomite and test it for certain properties, and then you'll grow crystals all over it. If you don't have a UV light, skip it and perform the rest of the tests.
2. Complete the first data table for the sample before following the instructions on the video. You are looking for the color, streak, hardness, density, luster, cleavage, fracture, tenacity, acid reaction, and fluorescence.
3. Don't wash your dolomite sample. You want the dust layer on top so the crystals start growing more quickly.
4. Place the sample in your glass jar.
5. Pour the vinegar into the cup (not directly on your sample) until it's nearly submerged.
6. Move your experiment to a warm location.
7. Observe your rock formation over the next week and record your observations in the second data table. You can opt to take pictures and paste them into the data table.
8. When all the vinegar has evaporated, remove the sample and put on display (after recording your last observation).

Popcorn Rock Data Table 1

Test Type	Result of Test
Color	
Streak	
Hardness Mohs' Scale: (1-10)	Fingernail (2.5), Penny (3.5), Nail (5.5), Steel file (6.5), Streak plate (7)
Mass (grams)	
Volume of Water Displaced (mL)	
Density	$(\rho = m / V)$
Luster	Circle all that apply: metallic/submetallic/glassy/adamantine/resinous/silky/pearly/greasy/pitchy/waxy/dull
Cleavage	Perfect, good, poor, none and in 1, 2, or 3 directions?
Fracture	Conchoidal, uneven, hackly, splintery, earthy, smooth and in which planes?
Tenacity	Circle all that apply: brittle/sectile/malleable/ductile/flexible-elastic/flexible-inelastic
Acid Test	Chemical or clastic rock?
Fluorescence	What color in longwave UV? (Do not attempt to expose to shortwave UV.)

Popcorn Rock Data Table 2

Draw your rock sample observations below:

Date:	Date:
Date:	Date:
Date:	Date:
Date:	Date:

Reading

Dolomite is made of calcium magnesium carbonate ($\text{CaMg}(\text{CO}_3)_2$) and is both a mineral and a rock. Dolomite comes in all kinds of colors, including white, gray, pink, peach, yellow and orange ... even colorless. Dolomite gives a white streak, which is hard to see on a white streak plate, and the hardness ranges from 3.4 to 4 on the Moh's hardness scale. Specific gravity for dolomite is 2.8 to 3, with a vitreous (glassy), pearly luster and rhombohedra cleavage on two planes and conchoidal fracture on the third. It's brittle (think tenacity), and is usually found around limestone. Dolomite is a chemical rock, since it reacts to acid. Dolomite fluoresces bluish-white when placed under a longwave UV light, and pink when exposed to a shortwave UV light.

Exercises

1. What would happen if you warmed the vinegar first, and placed it on a heating pad during your experiment?
2. What is it in the dolomite samples that make the aragonite crystals grow?
3. What else can you try instead of vinegar?

Answers to Exercises: Popcorn Rock

1. What would happen if you warmed the vinegar first, and placed it on a heating pad during your experiment?
(The vinegar would evaporate faster, making the crystals grow faster.)
2. What is it in the dolomite samples that make the aragonite crystals grow? (magnesium)
3. What else can you try instead of vinegar? (answers vary)