

What is a geode. Wikipedia describes Geodes as follows;

<sup>1</sup> Geode (Greek γεώδης - ge-ōdēs, "earthlike") are geological secondary structures which occur in certain sedimentary and volcanic rocks. They are themselves of sedimentary origin formed by chemical precipitation. Geodes are essentially hollow, vaguely spheroid-to-oblate masses of mineral matter that form via either of two processes:

- By the filling of vesicles (gas bubbles) in volcanic to sub-volcanic rocks by minerals deposited from hydrothermal fluids or
- By the dissolution of igneous nodules or concretions (that were deposited syngenetically within the rock formations in which they are found) and partial filling by the same or other minerals precipitated from diagenetic water, groundwater, or hydrothermal fluids.

Geodes differ from vugs in that the former were formed as early, rounded, structures within the surrounding rock and are often removed intact, whereas vugs are irregularly shaped pockets, voids or cavities within a formation, often along a vein or in breccia. Geodes also differ from "nodules" in that a nodule is a mass of mineral matter that has accreted around the nodule nucleus. Both structures had the minerals contained within, deposited from groundwater or hydrothermal processes. Geodes commonly have a chalcedony (cryptocrystalline quartz) shell lined internally by various minerals, often as crystals, particularly calcite, pyrite, kaolinite, sphalerite, millerite, barite, celestite, dolomite, limonite, smithsonite, opal, chalcedony and macrocrystalline quartz, which is by far the most common and abundant mineral found in geodes. Geodes are found mostly in basaltic lavas and limestones. The Warsaw Formation in the Keokuk region near the area where Missouri, Iowa, and Illinois join contains abundant geodes.

At the July 2017 TOTE show in Virginia Beach there was a vendor from Missouri selling Keokuk geodes. He had such an interesting story behind the history of the mine that he gets his geodes. The vendor explained how he must dig down as far as 90 feet into shale to reach these geodes. Most of the geodes contain water from the prehistoric era. He mentioned that he is also finding a lot of fossils that are new and have yet to be identified in this shale layer. He had some unique skills in determining the value of his geodes, he would first smell them for chemical content and then shake them for water content. He would then base his price from that. I choose two geodes, one he could guarantee that had a hollow and the other he only sold to me for a few dollars because he knew it would be a solid.

Our club is currently selling two types of geodes. The Moroccans from Africa and a variety from Mexico including Las Choyas, Baby Bravo's and Druzy Mist.

<sup>2</sup> The Moroccans are known as sedimentary geodes and are more complex and diverse in origin, shape, and mineral content. Sedimentary geodes most often occur in formations of calcareous marine sediments such as limestone and dolomite rock.

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Missouri Keokuk Geodes

(Cont'd from prior page.) Most sedimentary geodes originate as calcite concretions—small zones within the sediments that are heavily cemented by calcite. These concretions often form where organic remains of plants and animals have decomposed to create an anaerobic (oxygen-poor), alkaline environment that encourages calcite to precipitate from circulating, calcium-rich, acidic groundwater. Later, if the groundwater chemistry changes and becomes acidic, it dissolves the calcite to leave a void. Mineral-rich groundwater can then refill the void and, under the right conditions, precipitate minerals as crystals that fill or partially fill the void. Sedimentary geodes most often contain quartz, but can also contain such minerals as calcite, barite, gypsum, selenite, pyrite, and strontianite. Unlike the generally spherical shape of volcanic geodes, the shape of sedimentary geodes is often elongated or irregular.

The Moroccan geodes react to both short and longwave ultraviolet light, giving off a nice yellow color in both. The yellow color comes from the layer of massive white quartz that encases the inside of the geodes rather than from the drusy quartz. During the TOTE show we tested many of our customer's geodes under both short and longwave UV light, and we had some give off a nice fluorescent green.



<sup>2</sup> The Geodes we sell that come from Mexico, are geodes that form in extrusive magmatic (volcanic) formations. In volcanic formations, geodes originate as gas bubbles (vesicles) in lava that later fill with circulating groundwater rich in silica or other elements. As temperatures and pressures decrease, the dissolved mineral components precipitate out of solution to form crystals on the vesicle walls. Volcanic geodes are generally spherical, reflecting their origin as gas bubbles within the solidifying magma. The interior of volcanic geodes is usually filled with crystals of quartz or the zeolite-group minerals.

Most of the geodes that are filled with blue calcedony don't fluoresce. But we noticed the Baby Bravos and Drusy Mist gave off a beautiful fluorescent green, blue, or purple in the UV light. A few of the Las Choyas that were filled with brown crystal formation gave off a fluorescent green as well.

Drusy Mist



Baby Bravos



Las Choyas



### Geode Resources:

- <sup>1</sup> <https://en.wikipedia.org/wiki/Geode> and <http://www.americangeode.com/cracking.php>
- <sup>2</sup> Excerpts taken out of an article written by Richard & Cheryl Sittinger in the January 2009 Mineral of the Month club.
- <https://www.mindat.org/min-7628.html>