

The Many Faces of Calcium Carbonate (Limestone)

By Ronald P. D'Amelia

Limestone is a rock made mostly of the minerals calcite and aragonite, which are different three-dimensional forms of the chemical compound calcium carbonate (CaCO_3). Calcium carbonate is often found in sea shells and bones of sea creatures, and when these settle on the ocean floor for millions of years it forms limestone. Limestone can also come from the combination of soluble calcium (Ca) and carbon dioxide (CO_2) from water in lakes and oceans.

The world's largest limestone quarry is at the Michigan Limestone and Chemical Company in Rogers City, Michigan. Limestone has many uses: as a building material, as a white "filler" in products such as toothpaste or paints, and as a chemical raw material for the manufacture of cement and glass.

There are many different names used for limestone. These names are based upon how the rock is formed and its density, appearance, and chemical composition. Some of the more commonly used names are chalk, travertine, and marble. Chalk is a soft limestone with a fine texture. Travertine is a limestone that forms by evaporation of an aqueous (water) solution of CaCO_3 , often in caves. It can produce unique formations such as stalactites (icicle-shaped CaCO_3 , hanging from the roof of the cave) or stalagmites (formations that "grow" upward from the floor of the cave).

Marble, on the other hand, is limestone that was heated and squeezed by natural rock-forming temperatures and pressure, making the limestone re-crystallize. This re-crystallized limestone can be polished into a beautiful rock called marble that can be used for sculptures and for decorative building materials.

So, as you can see, naturally-occurring minerals such as calcite and aragonite, as well as rocks such as limestone, marble, and travertine show the many faces of an inorganic crystalline solid called calcium carbonate, and they all have the chemical formula CaCO_3 .

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Fossilized Limestone



Calcite Limestone



Porous Limestone-ppt of CaCO_3



Stalactites and Stalagmites



Polished Marble



References

- <http://geology.com/>