NATURALLY OCCURRING CARBONATE MINERALS AND THEIR USES

Mamadaliyev Adkhamjon Tukhtamirzaevich
Namangan Institute of Engineering and Construction
12, I.Karimov street, Namangan district, 160103, Republic of Uzbekistan

Abstract: *This article provides information on carbonate minerals found in nature, discusses their composition, occurrence and in what fields they are used.*

Key words: *Carbonic acid, limestone, magnesite, carbonate minerals, calcite, cement, lime, dolomite, malachite, azurite, malachite.*

Carbonates are salts of carbonic acid, commonly found as rock-forming minerals in sedimentary and metamorphic rocks. The basis of the crystal structure of carbonates is served by planar complex anions, which can be connected to each other to form chain, layered or framework structures. Independent elements that do not disintegrate even when the mineral melts take part in their crystal lattices. The most common are calcite, magnesite, dolomite and malachite.

Calcite mineral CaCO3. The name comes from the Latin word "calc" - lime. A synonym is calcareous spar. Chemical composition: Sa = 40.04%; C = 12%; O = 47.96%. As an alloy, Mg, Fe, Mn can sometimes be Zn, Sr. The syngony is trigonal, the symmetry is ditrigonal – scalenohedral – L33L23PC

The origin of calcite is mainly formed in sedimentary, biogenic, hemogenic, hydrothermal veins and magmatic carbonatites. Calcite is found in abundance in the Chotkal-Kurama mountains of our Republic, in the mines of Western and Southern Uzbekistan. Calcite is used in the construction industry of the national economy. Calcite is used as a raw material in the production of building stones, lime, cement, and metamorphically changed limestones, i.e. marbles, are used as an excellent covering material. Currently, the number of factories producing high-quality cement from limestone minerals in our independent Republic is increasing. As a result, the price of cement required for construction is falling.

Another carbonate mineral is dolomite, whose formula is CaMg(CO3)2. French engineer who described dolomite deposits for the first time and named after the mineralogist Dolomé.

The chemical composition of dolomite is Ca-21.73%, Mg-13.18%, C-13.03%, O-52.06%, Fe and Mn can be found as a mixture. The color of dolomite is grayish white, sometimes with yellowish, brownish and greenish hues. The luster is vitreous. The connection plane is perfectly rhombohedral (1011). Hardness 3.5-4. The relative weight is 2.8-2.9 g/cm3. The syngonia is trigonal, the color is usually white, yellow and brown in earthy masses. The color of the line is white, light yellow or light gray. The luster is vitreous on the sides of the crystals. transparency - opaque.

Dolomite is mainly formed by sedimentation. In Uzbekistan, it is found in abundance in the Chotkal-Kurama mountains, in the mines of Western and Southern Uzbekistan. It is used as a refractory material, in metallurgy, as a building material, in the field of chemistry and other fields. Nowadays mineral fertilizers are produced from dolomites. Calcium and magnesium phosphate fertilizers were obtained using local carbonate raw materials under the guidance of Professor I.Shamshidinov of the Namangan Institute of Engineering and Construction.

Another representative of carbonate minerals is Malachite - Cu2[CO3](OH)2, which is derived from the Greek word "malaxe", which means flower. It was probably given this name because it resembles the color of this plant. Chemical composition: Cu=57.5%; C=5.4%; N=0.9%; O=36.2%. It can be CaO, Fe2O3, SiO2, etc. as a mixture. Syngonia is monoclinic, symmetry view – prismatic – L2PC.

Malachite's appearance is monoclinic, its crystals are prismatic, it is very rare. Syngonia is monoclinic and occurs in green. The color of the line is light green, the luster is from vitreous to diamond-like, and in fibrous species it is silky. Hardness — 3.5-4. Fragile. The connection is perfect. Density — 3.9-4.0.

Malachite is found mainly only in the oxidation zone of copper sulphide deposits, especially where it is concentrated in limestone or where the primary minerals are rich in carbonates.

The types of malachite found in large masses are used in all kinds of decorative work and to make luxury items - vases, boxes, tables and other objects with beautiful colors and pictures. A small piece of malachite powdered varieties are used for dyeing. In addition, copper is smelted from malachite ores together with other minerals.

Azurite-Cu3[C03]2 [ON]2. The name comes from the French word "azure" - blue. Synonym: copper azure. The name comes from the French word "azure" - louvard, the color of the air. Synonym - copper blue (copper blue). Chemical composition: Cu – 67%; C – 4.2%; O – 28.1%; H – 0.7%. The syngonia is monoclinic, the symmetry is prismatic – L2PC

Observed crystals have the form of short columns or prisms, as well as thick tablets. Mostly druse of small crystals, whole grain masses, sometimes aggregates and earthy masses structured like radial shafts is found in The earthy variety is called copper blue. The color of azurite is dark blue, and the granular piles are light brown. The line is smooth, and the hardness is 3.5-4 brittle. The connection is perfect. Density - 3.7-3.9.

Azurite is almost always found together with malachite in small amounts. It is caused by the oxidation of primary minerals, mainly copper. In Uzbekistan, it can be found in Korgoshinkon, Lochinkhana mines and mines in South Uzbekistan.

Azurite is sent to metallurgical furnaces for melting together with other oxygen compounds of copper in the national economy. Pure azurite can be used to make blue dye.

Magnesite – the name of the mineral MgCO3 (Magnesia in Greece) is given depending on the location. Chemical composition: Mg– 28.83%; C – 14.24%; O – 56.93%. It

can be Fe, Mn, Ca as an isomorphous mixture. Syngonia is trigonal. The form of symmetry is ditrigonal-scalenohedral – L33L23PC.

Magnesite is used in metallurgy for the production of fire-resistant bricks, for the production of special types of construction cement (Sorelssementi), for the production of insulators in the electrical industry, in the paper and rubber industry, and in the sugar industry.

Soda – Na2CO3•10H2O. The name comes from the Arabic word "salsola soda", a plant that grows on the seashore. This plant is rich in sodium carbonate. Chemical composition: Na - 16.07; C – 4.2%; H – 7.06%; O - 72.67%. The syngony is monoclinic, the symmetry is prismatic - L2PC. It is usually found in the form of granular masses, crusts, and wards. The color is colorless, white and gray. The luster is vitreous. Hardness 1-1.5. The relative weight is 1.42-1.47. Easily soluble in water. In the air it quickly loses its water content and turns pale. Soda is a mineral formed as a chemical sediment in lakes. Soda precipitates mainly in cold climates, thermonitrite precipitates in warm climates. It is also found in pneumatolite and hydrothermal deposits in very small quantities. Mines are known in Western Siberia, Kazakhstan, America (California and Nevada), China, and India. In Uzbekistan, Nurota is found around the Istiqkol and Kalgansor lakes at the foot of the mountain, in Chordara, Kyzylkum.

Soda is used in many industries, in soap making, glass, paint, as well as chemical and metallurgical industries.

In conclusion, it can be said that considering the fact that carbonate minerals are widespread in the territory of our Republic and are of great importance for the national economy, it is important to study and analyze them by types.

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