



4. MINERALS

↩ **Emerald Shakhkterskaya Slava (Miner's Glory)**
(30.5 x 14.0 x 12.5 cm, weight 6431 g).
The State Diamond and Jewellery Reserve (GOKHRAN)
of Russia, No 16960

The emerald belt contains rocks of variable genesis, from high-temperature rare metal pegmatite and zwitter (quartz-zinnwaldite rock) to low-temperature carbonate and quartz veins and chlorite-sericite metasomatic rocks. Each type of orebody is distinguished by its own geochemistry and mineralogy. Both primary and secondary beryllium mineralization are most interesting in the Ural Emerald Mines. In all, 192 mineral species and 56 mineral varieties have been described here (Table 1 on pp. 10–11).

Beryllium minerals are the most interesting in the Emerald Mines. Fifteen minerals, where Be is species-forming element, are known: beryl (and its famous gem variety emerald), chrysoberyl (including alexandrite), phenakite, euclase, milarite, bromellite, helvite, taaffeite, gadolinite-(Y), bavenite, bertrandite, roggianite, bityite, behoite, and clinobehoite.

Beryl, $\text{Be}_3\text{Al}_2\text{Si}_6\text{O}_{18}$

Beryl is abundant at the Ural deposits. It is attributed to prevailing minerals in both space and time and occurs in practically all rocks, veins, and alterations. Emerald, the most famous variety of beryl, is significant. Numerous varieties of color, habit, structure of mineral crystals, crystal-chemical features, and physical properties have been found in this beryl.

According to the growth conditions, the following varieties were identified.

- (1) Free-grown crystals in leached cavities of quartz-plagioclase veins and open fractures.
- (2) Porphyroblasts formed in solid medium, including pegmatite and quartz-plagioclase veins, and phlogopite, phlogopite-talc, and phlogopite-actinolite altered rocks.

The free-grown crystals of beryl are usually well formed, highly transparent and have smooth faces. Frequently, they are colorless; crystals with yellowish and bluish-greenish tint are less abundant and occur as light varieties of aquamarine and heliodor. The majority of free-grown crystals is attributed to colorless beryl, known as goshenite.

Beryl (0.8 x 1.3 cm). Mariinskoe deposit. Specimen by V.I. Zhernakov



Emerald crystals embedded in glimmerite. 32 x 31 9.5, вес 6265 г. Museum Kingdom of Crystals (Reich der Kristalle), No MSM 18203, Munich, Germany. Photo Michael B. Leybov
On the right page there is the water color drawing of this specimen painted by N. Kolpashnikov, Mining Museum of Saint-Petersburg Mining Institute



The Leuchtenberg emerald was found in 1831 during the discovery of the famous emerald locality at the Takowaja River in the Urals. Together with other emeralds, it was presented to the Russian Czar Nikolaus I. The Czar deposited the specimen at the Hermitage in St. Petersburg where a watercolour was painted of both front and back side of the emerald specimen.

Subsequently the specimen and the watercolour were passed to the St. Petersburg Mining Institute. On the occasion of the birthday of his son-in-law Maximilian von Leuchtenberg the Czar reclaimed the emerald. The watercolour was left at the Mining Institute where it is still today.

Maximilian von Leuchtenberg, Duke of Eichstatt, son of Eugene de Beauharnais, stepson of Napoleon Bonaparte, and grandson of the Bavarian King Maximilian I, had married Grand Duchess Maria Nikolayevna of Russia. He was a knowledgeable collector of minerals and so the Czar considered this emerald to be an adequate birthday gift.

Maximilian von Leuchtenberg sent the emerald back to his "Naturalienkabinett" at Eichstatt where he had a large collection of minerals. The Russian minerals in this collection at that time were said to be the largest and best collection of Russian minerals outside of Russia.

After Maximilians death on October 20, 1852, the principedom of Eichstatt with its inventory including men, animals, plants and minerals came back to the Bavarian state. 1854 the mineral collection was brought to Munich and became part of the Bavarian Mineralogical State Collection. This included the Leuchtenberg emerald which is today on display in the Museum Kingdom of Crystals (Reich der Kristalle), part of the Mineralogical State Collection (<http://reich-der-kristalle.muenchen.museum>) (after Dr. Rupert Hochleitner, Senior Curator of the Museum "Kingdom of Crystals", Munich, Germany)



Emerald. Crystal of 6.5 cm high. It weighs 560 grams or 2800 ct. Specimen: American Museum of Natural History (AMNH #42612), New York, USA.
© Photo by Harold and Erica Van Pelt

It was apparently given to the museum in 1958 by Alastair Bradley Martin, (the grandson of steel magnate Henry Phipps). At one time, in the early 1960's, it was on display in the entrance of old mineral hall in a large safe. Now it resides in central gem case



Beryl, cluster of crystals (up to 2.0 x 0.5 cm) in a form of "sun" in glimmerite.
Specimen: 7.3 x 7 x 3.5 cm.
Vernadsky State Geological MuseumRAS, No MH-25810, Prokhorova collection



Emerald embedded in quartz. Length of crystal is 2.3 cm. Pervomaiskoe deposit.
Specimen by V.I. Zhernakov

