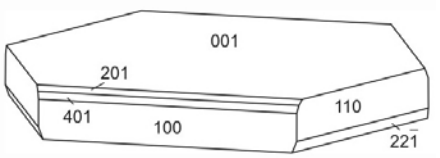


219. **Volborthite** crystal.
Measuring and drawing: V.A. Popov.

Delvauxite and **dufrenite** were mentioned by Sumin (1953) in the Mednorudyanskoe specimens with wavellite stored in the Fersman Mineralogical Museum, Russian Academy of Sciences, Moscow, in a description of the crusts on limonite together with brownish radial aggregates of Fe phosphates. No other data exist for these minerals.

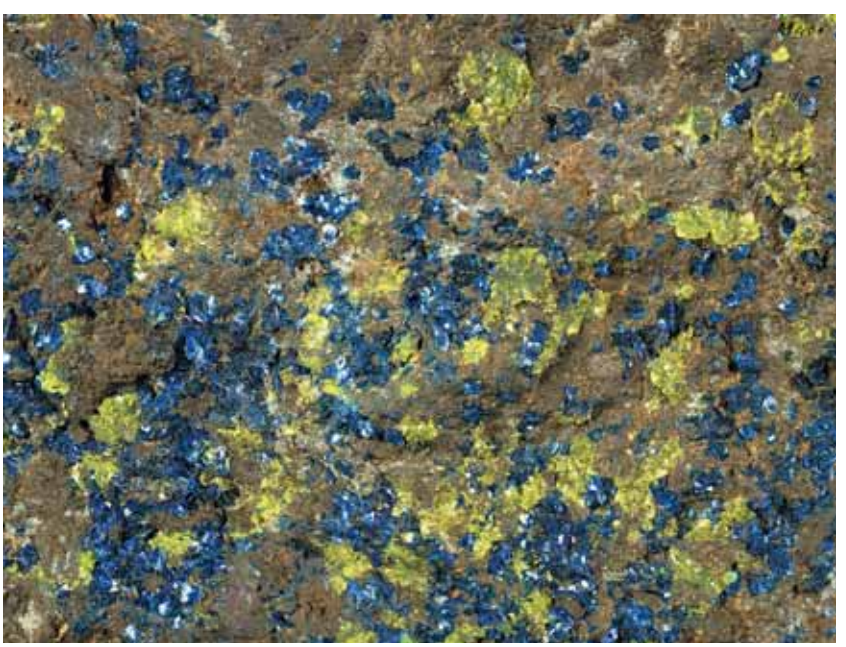
Beraunite was reported by Sumin (1953) with dufrenite, delvauxite and *"fischerite"* as brown radial and fibrous aggregates in the Mednorudyanskoe specimens stored in the Fersman Mineralogical Museum, Russian Academy of Sciences, Moscow. We identified possible beraunite of 1–3 mm in size in one sample with goethite as reddish brown micro-lammelar aggregates. The strongest reflections in X-ray diffraction pattern are (d, Å; *I*): 19.6 (49); 9.56 (39); 4.80 (36); 7.25 (26) and some reflections are referred to goethite.

Planerite at the Mednorudyanskoe deposit was reported by B.N. Bashkov in Brief Guide of Deposits of Ural Minerals (1916). There is no description of this mineral, as no other finds are known.

Vanadates and Arsenates

Among the minerals of these chemical classes, only volborthite and chalcophyllite are meaningfully indentified at Mednorudyanskoe.

Volborthite was mentioned by Gustav Rose (1842) as fine thin green plates and their intergrowths in the geodes of brown iron. Later, Koksharov (1870) mentioned hexagonal plates of the mineral in small druses and clusters on limonite. Similar yellow-green soft plates and clusters in a small number of samples were observed by Soloviev (1953), who indicated their easy decomposition in acids and positive reaction for vanadium.



220. **Volborthite** with **azurite**.
Image size 3.6x2.6 cm.
Mednorudyanskoe deposit.
Fersman Mineralogical Museum RAS #24862, I.N. Kryzhanovsky, 1912.
Photo: M.B. Leybov