

Crystal Data: Tetragonal. *Point Group:* 4/m. As aggregates of anhedral grains to 0.6 mm.

Physical Properties: *Cleavage:* Distinct on {100}. *Tenacity:* Brittle. *Fracture:* Uneven. Hardness = ~6 VHN = 819 (754-858) (150 g load). D(meas.) = n.d. D(calc.) = 5.538

Optical Properties: Opaque. *Color:* Black; light gray in reflected light. *Streak:* Brownish black. *Luster:* Submetallic to metallic.

Optical Class: n.d. Anisotropic.

R₁-R₂: (470) 28.7-27.8, (546) 27.6-26.6, (589) 27.2-26.1, (650) 26.5-25.4

Cell Data: *Space Group:* I4/m. *a* = 9.9043(7) *c* = 2.8986(9) *Z* = 1

X-ray Powder Pattern: Babuna River valley, near Nežilovo village, Republic of Macedonia. 3.128 (100), 3.497 (33), 2.424 (27), 2.214 (23), 1.554 (18), 2.178 (17), 1.651 (16)

| | |
|------------------------------------|-------------|
| Chemistry: | (1) |
| BaO | 5.16 |
| PbO | 24.50 |
| ZnO | 0.33 |
| Al ₂ O ₃ | 0.50 |
| Fe ₂ O ₃ | 11.45 |
| TiO ₂ | 4.19 |
| MnO ₂ | 44.81 |
| <u>Mn₂O₃</u> | <u>9.90</u> |
| Total | 100.84 |

(1) Babuna River valley, near Nežilovo village, Republic of Macedonia; average of 5 electron microprobe analyses supplemented by IR, XANES and Mössbauer spectroscopy, Mn⁴⁺:Mn³⁺ adjusted for charge balance; corresponds to Pb_{1.03}Ba_{0.32}(Mn⁴⁺_{4.85}Fe³⁺_{1.35}Mn³⁺_{1.18}Ti_{0.49}Al_{0.09}Zn_{0.04})_{Σ=8.00}O₁₆.

Mineral Group: Hollandite supergroup, coronadite group.

Occurrence: In hydrothermal veins that cut metamorphic rocks in an orogenic complex.

Association: Franklinite (relics), gahnite, quartz, roméite, almeidaite, Mn-analogue of plumbiferite, zincohögbomite analog with Fe³⁺ > Al, zincochromite, Zn-bearing talc, Zn-bearing muscovite, barite, zircon.

Distribution: Found in the Babuna River valley, in talus at the bottom of Kalugeri Hill, near Nežilovo village, about 40 km SW of Veles, Republic of Macedonia.

Name: For a member of the coronadite group with Fe³⁺ as the major charge-compensating octahedral cation instead of Mn³⁺.

Type Material: A.E. Fersman Mineralogical Museum, Russian Academy of Sciences, Moscow, Russia (4787/1) and the National Institution Macedonian Museum of Natural History, Skopje, Macedonia (PNMG 790).

References: (1) Chukanov, N.V., S.M. Aksenov, S. Jančev, I.V. Pekov, J. Göttlicher, Y.S. Polekhovskiy, V.S. Rusakov, Y.V. Nelyubina, and K.V. Van (2016) A new mineral species ferricoronadite, Pb[Mn⁴⁺₆(Fe³⁺, Mn³⁺)₂]O₁₆: mineralogical characterization, crystal chemistry and physical properties. *Physics and Chemistry of Minerals*, 43(7), 503-514. (2) (2018) *Amer. Mineral.*, 103, 2525 (abs. ref. 1).