

MOËLOITE, $\text{Pb}_6\text{Sb}_6\text{S}_{17}$, A NEW MINERAL FROM TUSCANY, ITALY

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The new mineral moëloite was found at the Ceragiola marble quarry, near Seravezza (Apuan Alps, Tuscany), within small cavities in calcite veins together with sulfur, enargite and bournonite. It occurs as black acicular [010] flexible crystals, up to (1 x 0,2) mm, with metallic lustre and black streak. Moëloite is orthorhombic a 15.328(3), b 4.0400(8), c 23.054(5) Å, V 1427.6(5) Å³. Strongest X-ray lines (d (Å), hkl): 3.427 (403); 3.047 (214); 2.844 (503); 2.779 (314); 2.753 (411). EPMA (wt. %): Pb 49.94, Sb 29.47, S 21.76, Sum 101.17. Empirical formula $\text{Pb}_{6.04}\text{Sb}_{6.04}\text{S}_{17}$; ideally $\text{Pb}_6\text{Sb}_6\text{S}_{17}$ ($Z = 2$), according to the crystal structure [$R = 12.9\%$ for 1329 unique reflections with $I \geq 2\sigma(I)$]. In Makovicky's classification, moëloite belongs to the vast group of rod-layer Pb sulfosalts ($\text{Pb}_6\text{Sb}_6\text{S}_{16}$) rods parallel to b are connected along c by an additional S atom, bound only with two S atoms ($\text{S-S} = 2.02$ Å). It gives an original (S₃)₂- trimer, with the crystal-chemical formula $\text{Pb}_6\text{Sb}_6\text{S}_{14}(\text{S}_3)$. Moëloite is the second natural sulfosalt with S-S bonding, together with livingstonite, ($\text{HgSb}_4\text{S}_6(\text{S}_2)$). It is dedicated to Y. Moëlo, who firstly synthesized this phase in 1983 by dry way at 350-375°C, starting from natural semseyite with a sulfur excess. At Ceragiola, the association with sulfur and enargite confirms the role of a high $f\text{S}_2$ for the stabilization of moëloite. This new mineral and its name have been approved by the CNMMN-IMA (vote n° 98-045). Type material has been deposited at Museo di Storia Naturale e del Territorio, Università di Pisa, Italy.