

Mcalpineite from the Gambatesa mine, Italy, and redefinition of the species

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ABSTRACT

Mcalpineite has been found in the Gambatesa mine (eastern Liguria, Italy). It occurs in a quartz vein mainly as yellowish green earthy crusts consisting of poorly crystallized mc Alpineite intergrown with an unidentified Cu-Te phase, as well as quite pure aggregates of well euhedral emerald green crystals (individually reaching up to 50 μm), associated with black fragments of paratellurite (TeO_2) and weissite (Cu_{2-x}Te). The chemical formula of this rare mineral, found at the McAlpine mine (type-locality; California, U.S.A.) and at the Centennial Eureka mine (Utah, U.S.A., co-type locality), was originally given $\text{Cu}_3\text{TeO}_6 \cdot \text{H}_2\text{O}$. X-ray powder diffraction and selected-area electron diffraction data of mc Alpineite are in good agreement with those of synthetic Cu_3TeO_6 . In addition no evidence for structural OH group was detected by micro-Raman analysis carried out on samples from Gambatesa, Centennial Eureka, and McAlpine (co-type sample) mines. Taking into account structural, topological, and experimental evidence, the crystal structure and chemical composition of mc Alpineite must be revised: the mineral crystallizes in the $Ia\bar{3}$ space group and the correct chemical formula is Cu_3TeO_6 .

Keywords: Mc Alpineite, Gambatesa mine, crystal structure, TEM, XRPD