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Dessauite, $(Sr,Pb)(Y,U)(Ti,Fe^{3+})_{20}O_{38}$, a new mineral of the crichtonite group from Buca della Vena mine, Tuscany, Italy

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ABSTRACT

Dessauite, a new mineral in the crichtonite group, occurs within cavities in calcite veins as tabular {001} rhombohedral, black, millimeter-sized crystals at Buca della Vena Mine, Apuan Alps (Tuscany, Italy). It is associated with derbylite, hematite, rutile, karelianite, siderite, and calcite. Dessauite is trigonal, space group $R\bar{3}$, with a = 9.197(1) Å, α = 68.75(2)°. Optically, dessauite is opaque and shows low bireflectance and very weak pleochroism. Electron microprobe analyses led to the following simplified chemical formula: $(Sr,Pb)(Y,U)(Ti,Fe^{3+})_{20}O_{38}$. The crystal structure of dessauite was refined from single-crystal X-ray diffraction data to R = 0.065. Dessauite is isostructural with the others members of the crichtonite group; a peculiar structural feature is the presence of additional, partially occupied octahedral sites. A comparison of the crystal-chemical formulas of all the minerals within the crichtonite group is presented. In view of the structural information, the analytical data have been re-arranged on the basis of the crystal-chemical formula $ABC_{18}T_2O_{38}$, rather than $AM_{21}O_{38}$.