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Polyoxoniobates from Cajati, São Paulo, Brazil

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Menezesite and melcherite are two polyoxoniobates described from the contact zone between dolomite carbonatite and "jacupirangite" (=a pyroxenite) at the Jacupiranga mine, in Cajati Co., São Paulo state, Brazil.

Menezesite is the first natural heteropolyniobate [1]. The second natural heteropolyniobate, aspedamite, isostructural with menezesite, was described in the Herrebøkasa Quarry, Aspedammen, Østfold, Southern Norway [2]. The simplified formula is $(\square,Ba,K)_{12}(\square,Mg)_3Zr_4(BaNb_{12}O_{42}).12H_2O$. The end-member formula was originally expressed as $Ba_2MgZr_4(BaNb_{12}O_{42}).12H_2O$, but it should be more correctly expressed as $\square_{12}Mg_3Zr_4(BaNb_{12}O_{42}).12H_2O$ [2]. It is cubic, Im-3, a = 13.017(1) Å, V = 2206(1) Å^3, Z = 2. The structure is based on the heteropolyanion $[BaNb_{12}O_{42}]^{22-}$, which consists of twelve face- and corner-sharing NbO_6 octahedra that surround the 12-coordinated Ba cation. This type of heteropolyanion was originally described by Dexter and Silverton [3].

Melcherite is the second natural hexaniobate [4]. The first one is peterandresenite [5] and the third is hansesmarkite [6], both from in Tvedalen, Larvik, Vestfold, Norway. Its simplified formula is $(Ba,K)_2(Na,Ca)_2Mg[Nb_6O_{19}].6H_2O$. Chemical composition varies from $Ba_2Na_2Mg[Nb_6O_{19}].6H_2O$ to $(BaK)(NaCa)Mg[Nb_6O_{19}].6H_2O$. It is trigonal, R-3, a = 9.0117(6) Å, c = 23.3986(16) Å, V = 1645.64(19) Å^3, Z = 3. The structure is based on the $[Nb_6O_{19}]^{8-}$ anion, which consists of clusters of mutually 6 edge-sharing NbO_6 octahedra forming a super-octahedron. This type of polyanion was originally described by Lindqvist [7].

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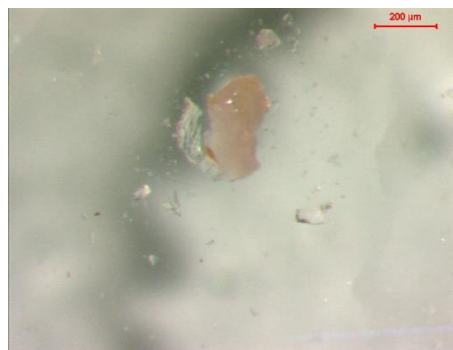[6] Friis H et al. (2015) IMA Nomenclature Proposal 2015-067
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Figure 1: Melcherite from Cajati