

A niobium phosphate bronze closely related to the tungsten phosphate bronzes family: Na₄Nb₈P₆O₃₅

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Description

A new niobium phosphate bronze Na₄Nb₈P₆O₃₅ has been isolated. Its structure was solved by single crystal X-ray diffraction. It crystallizes in the orthorhombic system with the space group Pbam. The cell parameters are a= 8.4992 (7) Å, b= 15.3390 (8) Å, and c= 10.5913 (9) Å. The framework [Nb₈P₆O₃₅][∞] consists of [Nb₃P₂O₁₇][∞] layers, sharing the corners of their octahedra and forming [Nb₆P₄O₃₁][∞] bilayers. The latter bilayers are linked along c through [Nb₂P₂O₁₄] units, built up themselves of two edge-sharing NbO₆ octahedra connected to two PO₄ tetrahedra. The [Nb₃P₂O₁₇][∞] layers are very closely related to the structure of the diphosphate tungsten bronzes with pentagonal tunnels (DPTB p's) and can be described as derived from the m= 3 member of the series (PO₂)₄(WO₃)_{2m}. The relationships with other niobium phosphate bronzes is also discussed as well as the great ...