

## **Ferri-ottoliniite and ferriwhittakerite, two new end-members of the new Group 5 for monoclinic amphiboles**

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### **ABSTRACT**

Mineralogical and crystal-chemical descriptions are provided for two end-members of the new Group 5 introduced by Leake et al. (2004) in the nomenclature of amphiboles. This new classification scheme recognizes the occurrence of compositions with B-site populations intermediate between (Ca,Na) amphiboles and (Mg,Fe,Mn,Li) amphiboles. Its implications for the classification and nomenclature of Li-rich amphiboles are also discussed in this paper. Holotype ferri-ottoliniite [ideally  $A^{\square}B(NaLi)C(Mg_3Fe_2^{3+})Si_8O_{22}(OH)_2$ ] has  $a = 9.535(3)$ ,  $b = 17.876(6)$ ,  $c = 5.294(2)$  Å,  $\beta = 102.54^\circ(1)$ ,  $V = 880.9$  Å<sup>3</sup>, and unit formula  $A^{(K_{0.07}Na_{0.38})}B(Na_{0.70}Li_{1.24}Ca_{0.06})C(Mg_{1.35}Fe_{0.92}^{2+}Mn_{0.13}^{2+}Zn_{0.31}Fe_{1.71}^{3+}Al_{0.10}Ti_{0.06}Li_{0.42})Si_8O_{22}(OH_{1.51}F_{0.47})$ . Holotype ferriwhittakerite [ideally  $A^B(NaLi)C(Mg_2Fe_2^{3+}Li)Si_8O_{22}(OH)_2$ ] has  $a = 9.712(9)$ ,  $b = 17.851(23)$ ,  $c = 5.297(2)$  Å,  $\beta = 103.63^\circ(5)$ ,  $V = 892.5$  Å<sup>3</sup>, and unit formula  $A^{(K_{0.13}Na_{0.64})}B(Na_{1.27}Li_{0.62}Ca_{0.11})C(Mg_{1.47}Fe_{0.58}^{2+}Mn_{0.12}^{2+}Zn_{0.40}Fe_{1.48}^{3+}Al_{0.10}Ti_{0.12}Li_{0.73})Si_8O_{22}(OH_{1.30}F_{0.72})$ . The root names have been chosen to acknowledge the contribution given to crystal-chemical studies of minerals, and particularly of amphiboles, by L. Ottolini (Pavia, Italy) and E.J.W. Whittaker (Oxford, U.K.).