

## **Adding further complexity to the polybasite structure: The role of Ag in the *B* layer of the *-M2a2b2c* polytype**

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### **ABSTRACT**

We report data on the composition and crystal structure of the most Ag-rich (15.63 apfu) natural polybasite yet discovered. It shows the *-M2a2b2c* polytype. The crystal studied was found in a sample (mineralogical collection of the Royal Ontario Museum) from Gowganda, Timiskaming District, Ontario, Canada. Electron microprobe analysis yields the formula  $[\text{Ag}_6(\text{Sb}_{1.78}\text{As}_{0.18})_{\Sigma=1.96}\text{S}_7]$   $[\text{Ag}_9(\text{Ag}_{0.63}\text{Cu}_{0.43})_{\Sigma=1.06}\text{S}_4]$ . Lattice parameters are  $a = 26.2625(4)$ ,  $b = 15.1623(5)$ ,  $c = 24.1061(6)$  Å,  $\beta = 90.045(5)^\circ$ ,  $V = 9599.0(4)$  Å<sup>3</sup>. The structure was refined in the space group *C2/c* to  $R = 0.0581$  using 7725 observed reflections [ $I > 2\sigma(I)$ ]. The refinement shows that one of the three structural positions of the *B* module layer usually occupied by Cu is dominated by Ag. Crystal-chemical characteristics are compared with published data on the other members of the pearceite-polybasite group. Some remarks concerning nomenclature are also given.

**Keywords:** Crystal structure, chemical composition, polytype, silver minerals