

Linking structure and chemistry in the Schorl-Dravite series

ERICH S. BLOODAXE,¹ JOHN M. HUGHES,^{1,*} M. DARBY DYAR,² EDWARD S. GREW,³
CHARLES V. GUIDOTTI³

AND

¹Department of Geology, Miami University, Oxford, Ohio 45056, U.S.A.

²Department of Geography and Geology, Mount Holyoke College, South Hadley, Massachusetts 01075, U.S.A.

³Department of Geological Sciences, University of Maine, Orono, Maine 04469-5711, U.S.A.

ABSTRACT

Nine tourmaline crystals for which major and minor element composition data are available have been examined by single-crystal X-ray structure refinement. The single crystals were then analyzed for major elements (by electron microprobe methods), Fe³⁺/Fe²⁺ (by synchrotron micro-X-ray absorption near-edge spectroscopy), B and Li (by secondary ion mass spectrometry), and bulk H content (by uranium extraction). Despite recent claims based on chemical analyses, structure analysis suggests that no B exists in tetrahedral coordination in these samples. Analysis of cation ordering between the Y and Z octahedral sites suggests that the occurrence of an Fe²⁺ atom on a Y octahedral site may be locally associated with the absence of Mg at both of the neighboring Z sites, as substitutions of Fe²⁺ on Y and Mg on Z require antithetic shifts of the O6 anion. *American Mineralogist*, Volume 84, pages 922–928, 1999