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Uvarovite from chromite-bearing ultramafic intrusives, Orissa, India, a crystal-chemical characterization using ^{57}Fe Mössbauer spectroscopy

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Abstract

EPMA analyses of uvarovite from the chromite-bearing ultramafic intrusive of Sukinda, India, show that uvarovite containing 9.83 to 17.68 wt% Cr_2O_3 represents a solid solution of the binary uvarovite-andradite series with $Uva_{34–58}And_{42–58}$. Associated chromite grains with 57–59 wt% Cr_2O_3 do not show any compositional variation from core to rim. ^{57}Fe Mössbauer spectroscopic studies on the uvarovite samples undertaken both at room temperature (298 K) and low temperature (110 K) indicate the presence of Fe^{3+} only in octahedral coordination. Uvarovite grew from chromite (Cr source) and pyroxenes (Al, Fe, and Ca source) of the ultramafic host rocks.

Keywords: Natural uvarovite, chromite, ultramafic intrusive, Eastern India