

# Chromian actinolitic hornblende from the Eastern Ghats, India

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Emerald green non pleochroic hornblende found in association with chromite-enstatite pyroxenites at Binny's old quarry in the Kondapalli region, Krishna district, is chromium-rich with  $\text{SiO}_2$  51.96,  $\text{TiO}_2$  0.03,  $\text{Al}_2\text{O}_3$  2.24,  $\text{Fe}_2\text{O}_3$  1.22,  $\text{Cr}_2\text{O}_3$  3.29,  $\text{FeO}$  3.52,  $\text{NiO}$  0.25,  $\text{MnO}$  0.25,  $\text{MgO}$  20.94,  $\text{CaO}$  12.30,  $\text{Na}_2\text{O}$  0.52,  $\text{K}_2\text{O}$  0.51,  $\text{H}_2\text{O}^+$  2.00,  $\text{H}_2\text{O}^-$  0.29,  $\text{F}$  0.91,  $\text{Cl}$  0.23, less  $\text{O}^{\equiv}\text{F}$ ,  $\text{Cl}$  0.42, total 100.04 giving  $\text{Si}$  7.26,  $\text{Ti}$  0.00,  $\text{Al}$  0.37,  $\text{Cr}$  0.36,  $\text{Fe}^{3+}$  0.13,  $\text{Fe}^{2+}$  0.41,  $\text{Ni}$  0.03,  $\text{Mn}$  0.03,  $\text{Mg}$  4.39,  $\text{Ca}$  1.92,  $\text{Na}$  0.14,  $\text{K}$  0.09,  $\text{OH}$  1.86,  $\text{F}$  0.40,  $\text{Cl}$  0.05. This should be named a chromian actinolitic hornblende. X-ray data give cell

parameters of  $a$  9.75,  $b$  18.06 and  $c$  5.34 Å with  $\beta$   $105^\circ 41'$ . The entry of  $\text{Al}^{3+}$  and  $\text{Cr}^{3+}$  into the tetrahedral position has considerably reduced  $a$  and to a lesser extent  $b$ , and increased  $c$ . Apparently this is the first reported occurrence of such an amphibole from the Eastern Ghats of India.

The chromite-pyroxenites are tectonically emplaced into the cores of overturned isoclinal anticlines. Palaeogenetic granites are injected along shear zones parallel to the cross-fold axial plane traces in the ultramafic bodies imparting false layering. Thin zones of the chromian amphibole occur along the contacts of granite and chromite pyroxenites. Biotite commonly replaces the amphibole along cleavages and grain margins. The development of the amphibole is related to metamorphism under high  $P_{\text{H}_2\text{O}}$  conditions converting coexisting pyroxenes, enstatite ( $\text{En}_{34}$ ) and diopside ( $\text{Ca}_{47}\text{Mg}_{47}\text{Fe}_6$ ) into amphibole.