

GEOLOGY OF THE MAGYATAHALLI PGE REEF OF THE CHANNAGIRI LAYERED COMPLEX, KARNATAKA, INDIA

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The Channagiri Layered Complex is composed of several tectonically separated blocks, together spanning about 30 km in length with thicknesses ranging from about 0.2 to 1 km. The block hosting the Magyatahalli PGE Reef is about 3 km long and 0.3 km wide. Mineralogy of the host rock is rather simple comprising mainly Al-rich (up to 20 w-% Al_2O_3) chlorite and Fe-rich chromite. Chromites are often zoned so that the center of a given grain may contain Cr_2O_3 in excess of 20 w-% whereas the rims are almost pure magnetite. Some base metal sulfides have also been identified from drill cores though they are generally very scarce and most often not associated with elevated PGE values. There seems to be two mineralogically distinctive members to this PGE deposit. One is dominated by platinum with sperrylite being the most common platinum-group mineral, whereas in the other one the predominant PGE is palladium and the mineralogy is characterized by various Pd-Sb alloys and Pd-Bi-Te minerals. The genesis of the mineralization is somewhat unclear yet at this point of the investigation. However, the evidence gathered so far suggests something other than a traditional orthomagmatic origin. This is backed-up by the general lack of base metal sulfides in favor of chromite, though a pure chlorite rock may contain significant PGE values regardless of the amount of chromite. The PGM textures show little evidence of hydrothermal alteration and remobilization but the PGE mineralogy itself displays some characteristics of fluid action as it seems that there are some OH-bearing Pt- and Pd-minerals present.