

MINERALIZATION AND FLUID INCLUSION STUDIES OF PRECAMBRIAN GRANITOID HOSTED COPPER OCCURRENCES, EASTERN DHARWAR CRATON, SOUTHERN INDIA

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Abstract

Precambrian granitoid hosted copper mineralization at Machanur, Thinthini, Kallur and Yegavakote in eastern Dharwar craton is confined to shear zones within the pink prophyritic granites. The mineralized zones are 'cataclastites', which are highly fractured, brecciated and to some extent mylonitised and the hydrothermal alterations are ubiquitous. Except at Yegavakote, disseminations and aggregates of chalcopyrite constitute the major ore mineral of copper, especially in quartz-sulphide and quartz-calcite veins. In the mineralized zones, the opaque minerals are represented by chalcopyrite, bornite, digenite, chalcocite, pyrite, haematite/specularite and magnetite. At Yegavakote, copper mineralization is associated with molybdenum, noticed in two ovoid quartz pipes emplaced within the migmatitic Peninsular gneiss. Pink feldspar veins filling fractures in quartz pipes are the carriers of ore minerals like molybdenite, chalcopyrite, pyrite, sphalerite and bornite. Mineralization in the above areas is essentially fracture controlled, cavity filling epigenetic hydrothermal type. The host granitoids are spatially related to the well-known gold bearing eastern greenstone belts and exhibit intrusive relationship with schistose formations of the belts. Fluid inclusions associated with copper mineralization at Machanur, Thinthini, Kallur and Yegavakote of moderate to high salinity (12.85-28.5 wt% NaCl), moderate density (0.63-1.05 g/cm³) and homogenization temperature range between 200-370°C. Similarities in their geologic setup, structural localization and their fluid characteristics, suggest that, the copper sulphide mineralization at Machanur, Thinthini and Kallur might be genetically similar and co-eval.

Keywords: Mineralization, fluid inclusions, Precambrian, granitoid, copper, Dharwar craton