

## FLUID INCLUSION STUDIES ON HYDROTHERMAL CALCITES FROM GOGI AREA, BHIMA BASIN, EASTERN DHARWAR CRATON, INDIA: IMPLICATIONS FOR URANIUM MINERALISATION

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### Abstract

Gogi uranium deposit is a fracture bound ore deposit, hosted in environs of Mesoproterozoic Bhima basin. The ore deposit is spatially associated with east-west trending Gogi-Kurlagere fault and located in the basin margin near Gogi - Kanchankayi area, Yadgir district, Karnataka. Pb-isotope data of hydrothermal calcites indicate ~1346Ma age of uranium mineralization. Ore petrographic study indicates co-precipitation of coarse-grained sparry calcites and euhedral pyrites and these mineral phases are intimately associated with uranium-mineralized veins. Primary fluid inclusions trapped in these sparry calcites and vein calcites are, therefore, representative of uranium bearing hydrothermal fluids and is the subject of present study. Two types of primary fluid inclusions were recognized, i.e. monophasic (Type 1), Table 1 and biphasic (Type 2), Table 1. Microthermometric studies were carried on biphasic-type-2 inclusions, which are rectangular, sub-rectangular, rounded to irregular in shape and their sizes vary between 6 μm and 32 μm. Microthermometric study on fluid inclusions of hydrothermal calcites of Gogi uranium deposit suggest low temperature (110-220 °C) and low salinity (<15 wt.%NaCl equivalent) of ambient hydrothermal fluids. Ore deposition was caused by mixing of low temperature fluids of contrasting composition (H<sub>2</sub>O-NaCl and H<sub>2</sub>O-CaCl<sub>2</sub>) and salinities. The mineralising fluid was emplaced at shallow level 'brittle deformation zones', possibly at a depth lesser than 1 km and was sourced from circulating meteoric fluids. Very low salinities of fluids contraindicate involvement of basinal brine during mineralisation process, thereby distinguishing it from unconformity type deposits.

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