

Mantle/Juvenile magmatic source for auriferous ore fluids of Hutti gold deposit, Hutti-Maski greenstone belt, southern India: Evidence from C, O, S isotopic systematics.

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Neoproterozoic metabasalt and metadacite hosted gold deposits in the Hutti schist belt, southern India, constitute the only deposits that are being mined for gold in India at present. Metamorphic origin of mineralizing fluids has been proposed earlier for these gold deposits [1]. C-O-S isotope studies of carbonates of the mineralised quartz-carbonate veins (QCVs) and sulfide minerals with gold have been studied to further understand the source and origin of auriferous fluid at Hutti gold deposits. $\delta^{13}\text{C}$ and $\delta^{18}\text{O}$ composition of carbonates of QCVs range from -0.9 to -5.8 (-4.2±1.6‰) and 8.5 to 25.9 (11.7±3.2‰) respectively. These values are consistent with the mantle (-6 ±2‰, [2]) or magmatic (-5 ±3‰, [3]) derived fluids. The heavier $\delta^{18}\text{O}$ values in some samples may be due to low temperature alteration as proposed for Gadag Gold Field [4]. The $\delta^{34}\text{S}$ values of pyrite range from 2.66 to 3.17 (2.9±0.4‰) and the fluid $\delta^{34}\text{S}_{\text{H}_2\text{S}}$ ranges from 1.4 to 2.0 (1.7±0.3‰). Such narrow $\delta^{34}\text{S}$ values are also consistent with the juvenile magmatic fluids (0 ± 2‰, [5]). Our studies therefore suggest juvenile magmatic origin for the mineralising fluids rather than metamorphic fluids.

References: [1] Mishra, B. and Pal, N. (2008) *Econ. Geol.*, 103:801-827; [2] Ohmoto, H (1986) *Rev Miner* 16. *Min. Soc. of America*, pp. 491–560; [3] Burrows, et al. (1986) *Nature*, 321:851–854; [4] Swain, et al (2015) *Ore Geol. Rev.* 70: 305-320; [5] Ohmoto & Rye (1979) *Geochem of Hydrothermal dep.* pp. 509–567.