TECHNICAL TALK

Geological and geochemical characteristics of the Tersang gold deposit in the Central Gold Belt, Peninsular Malaysia

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Abstract: Tersang gold deposit is located at the east of the Bentong-Raub Suture Zone in Pahang, Peninsular Malaysia. This deposit is hosted in sandstone (U-Pb detrital zircon dating: 319.3±5.9 to 337±2.6 Ma), breccia and felsic rhyolite (218.8±1.7 Ma). Ore minerals include pyrite, arsenopyrite, sphalerite, galena, geochronite, covellite and gold. The argillic alteration is dominant in the Tersang deposit and characterised by an assemblage of sericite, illite, and montmorillonite. Detailed paragenetic studies at Tersang revealed four pyrite types including euhedral to subhedral "spongy" pyrite with internal fracturing (pyrite 1), euhedral clean pyrite (pyrite 2) overgrown on pyrite 1, amorphous pyrite with high As and high Au (pyrite 3), crack-fill or vein pyrite with high As and low Au (pyrite 4). Pyrite 1 and Pyrite 3 are particularly enriched in Au, As, Co, Ni, Se, and Tl. Pyrite 1 and pyrite 2 show zoning of Co, Ni, As, and Se and they have low Ag/Au, and Ni/Co ratios indicating that these pyrites are likely of metamorphic origin. Sulphur isotope composition of pyrite, arsenopyrite and galena has a range of $\delta^{34}S$ values from -6.04 to 2.49‰. Additionally, these sulphide minerals are associated with primary hematite indicating that the sulphur may have been derived from the oxidation of the magmatic hydrothermal fluid at Tersang. Lead isotope ratios are 18.59 for Pb_20_6/Pb_20_4 and 15.75 for Pb_20_7/Pb_20_4 suggesting that lead was probably derived from the lower crust source rocks. Fluid inclusion studies yielded a homogenisation temperature range from 210 to 348°C with salinities between 1.74 and 11.93 wt % NaCl equiv. Laser Raman Spectrometry analysis indicates the presence of CO_2 (98.1-100 mol %) in fluids with a minor amount of CH_4 (0-1.9 mol %).

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