Presentation

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ARGEMELA, A HIGH-TONNAGE Sn-Li DEPOSIT IN CENTRAL PORTUGAL

INVERNO, Carlos M.C., INETI (plus CREMINER), INETI, , Ap. 7586, 2720-866 Alfragide (Lisboa), Portugal, CREMINER, Univ. Lisboa, Campo Grande, 1749-016 Lisboa, Portugal, Alfragide (Lisboa), 2720-866, Portugal, carlos.inverno@ineti.pt, FERRAZ, Paulo J.V., Beralt Tin & Wolfram Portugal (BTWP), Barroca Grande, Aldeia de S. Francisco de Assis, 6225-051, Portugal, and MOREIRA, Eugénia, Lab. INETI, R. Amieira, Ap. 1089, S. Mamede de Infesta (Porto), 4460-901, Portugal

Near-vertical Sn-Li stockwork quartz veins occur at Argemela; 3 hillside adits (at 522, 566, 599 m high) and opencasts led to Sn concentrates production in 1947/61. Three >450 m-long Government drill-holes in late 70's, together with current BTWP lithogeochemistry and 8 shallow drill-holes all point to continuity of mineralization from 650 m high to 0 m (subsoil), with a total resource of > 200 Million tonnes @ 0.1% Sn, 0.2% Li and estimated 0.1% Rb; a BTWP feasibility study is under way.

The Sn-Li quartz veins, hosted in Variscan-deformed Cambrian Beira Slates, are 5-50 cm thick, spaced 1(-2) m apart, infilling variably trending tension/shear fractures, suggestive of emplacement above a hidden granitic cupola, testified by both local spotted slates and microgranite dikes/apophyses intersected at great depth. The Sn ores are evenly abundant cassiterite (main Sn ore) and stannite. Amblygonite is the Li ore and Rb is contained mostly in white mica.

The earliest vein mineral is milky white to greenish, anhedral (anh.), mostly centimetric amblygonite. It was followed by ≤ 2.5 cm-wide, anh. to subhedral quartz I, packed with fluid inclusions (f. i.), and ≤ 2.4 mm-wide, anh. to euhedral (euh.) quartz II, with fewer f. i. The amblygonite - quartz contact zone contains most succeeding minerals. After quartz came 15 µm – 16 mm (mostly < 1 mm)-wide, anh. to euh. zoned cassiterite, with fine columbite-tantalite inclusions. Later formed white mica (≤ 3 mm-wide sheets; aggregates ≤ 1 cm) and anh. stannite (2 µm – 4.4 mm, mostly < 500 µm wide; aggr. ≤ 2 cm). The paragenetic sequence, with many overlaps between sequential vein minerals, is: amblygonite - quartz I - quartz II - cassiterite - arsenopyrite I - columbite-tantalite - chlorite I - fluorite – carbonate I - ?apatite? - white mica I - triphylite - white mica II – tourmaline - ?rutile? – molybdenite – sphalerite – stannite – chalcopyrite – carbonate II – pyrite – pyrrhotite – arsenopyrite II – chlorite II – chalcocite(?) – covellite - ?vivianite? – goethite/lepidocrocite.

Cassiterite with microprobe data of 0.1 – 0.2% Nb, Fe, Ti and Ir (up to 0.7% Fe, >1.0% Nb) and low/negligible Sb, Zn, As, Ag and Bi shows its granitic affiliation. Most of its grain rims have higher % Nb and Fe than cores. Geothermometry of Al-chlorite yields

formation temp. of < 200 ºC. Fluid inclusion study follows.

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