MAGMATIC CASSITERITE AND CRYOLITE MINERALIZATION IN THE PERALKALINE ALBITE GRANITE FROM PITINGA

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Important tin, rare metals (Zr, Nb, Ta, Y, REE) and cryolite mineralization in the Pitinga Mine is associated with the late albite granite of the Madeira pluton which occurs as a ca 2,5 Km2 subcircular body surrounded by an autometassomatic border.The fine- to medium-grained greyish porphyritic albite granite presents phenocrysts of quartz and subordinately Na-amphibole. The matrix is composed of albite, K-feldspar, quartz and accessory minerals such as lepidolite, biotite, Na-amphibole, cryolite, zircon, cassiterite, pyrochlore, columbite-tantalite, thorite, xenotime, magnetite, hematite, pyrite, ilmenite, rutile, galena, sphalerite and metamict minerals.Geochemically the nucleus of the albite granite is an A-type peralkaline (A/CNK = 0.836) phase enriched in Na2O (6.3 wt.%) and F (6.3 wt.%) with high Fe2O3/FeO (2.893) belonging to the magnetite series.Cryolite (0.01 – 5 mm) is subhedral to anhedral, interstitial and surrounded by Fe-oxide. Vermicular to rounded cryolite inclusions into quartz phenocrysts forming consecutive circular to hexagonal discontinuous rims (snowball textures), indicate rapid contemporaneous growth of quartz and cryolite.Cassiterite (0.005 – 5 mm) occurs as subhedral to euhedral individual crystals and small anhedral inclusions in micas, Na-amphibole and columbite-tantalite. Zonation in the cassiterite is due to variation in Ta content.The petrographic and geochemical features and the oxidised conditions of the albite granite indicate that cryolite and cassiterite occurs as magmatic phases crystallised in a specialised system. However, the origin of the albite granite, if originated from a residual melt, is controversial since the albite granite is not related to the previous facies by magmatic fractionation.