

Zoning in the Volta Grande tin-tantalum pegmatite, Nazareno, Minas Gerais, Brazil

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The São João del Rei pegmatite province embraces about 300 pegmatitic bodies and the Volta Grande is the most important one. Pegmatites are deformed and controlled by the northeastward trending foliation of the schistose amphibolite and by the flat lying fracture system. Along the contacts, the amphibolite is metasomatically replaced and biotite, holmquistite and epidote formed. Epidote-fluorite veinlets crosscut the biotite-rich aureoles around the amphibolite. Zoning can be depicted in orebody scale and mine. Pegmatites at the western part of the mine are richer in lepidolite and microlite and poorer in spodumene and tantalite than the eastern ones. From the six pegmatite bodies (named from A to F), the "A" body reveals an outstanding zoning, in which a white, medium- to fine-grained albitic margin is engulfed by a grey, coarse-grained intermediate zone with microcline pockets within a mass of quartz, albite, zinnwaldite, muscovite, microcline and spodumene. Coreward appears spodumene, in long, metric crystals orthogonally disposed in relation to the pegmatite contacts. Intergranular, late aqueous fluids, responsible for the mineralizations, deposited tantalite-columbite and cassiterite followed by the deposition of microlite (and uranmicrolite) as either, isolate, minute crystals or mantling tantalite. Apparently albite, microcline and spodumene were the first minerals formed, followed by their partial replacement by the micas. Lepidolite, quartz and minute amethyst (in minute, well formed, hyaline crystals) were the last minerals formed.