

CAMBRIAN PEGMATITIC AND HYDROTHERMAL MINERAL DEPOSITS: THE LAST MINERALIZATION RECORD PRIOR TO THE SOUTH ATLANTIC OPENING IN EASTERN BRAZIL

PEDROSA-SOARES, A. C., LOBATO, L. M., NOCE, C. M. Universidade Federal de Minas Gerais-Instituto de Geociências, Belo Horizonte, MG, Brazil

In eastern Brazil, a myriad of mineralized pegmatites and hydrothermal veins occur along the Eastern Pegmatite Province, in Minas Gerais, Bahia and Espírito Santo states. Those of Cambrian age are important records of the last metallogenetic episode prior to the South Atlantic opening in eastern Brazil. They host alkaline metals (lithium, beryllium), gemstones (aquamarine, alexandrite, emerald, tourmaline, and many others), ceramic minerals and cassiterite deposits. Geochronological data constrain this metallogenetic epoch from 530 Ma to 500 Ma, i.e., clearly related to the Araçuaí Orogen post-collisional granitogenesis. Two distinct pegmatite populations are connected to the peraluminous, S-type granites. One population comprises lithium-rich pegmatites, emplaced in relatively shallow depths (5-8 km), that have been variously mined for spodumene, petalite, ambligonite, lepidolite and cassiterite. The other S-type pegmatite population, crystallized at intermediate depths (10-12 km), is the source of large amounts of gem-quality tourmaline. High-K calc-alkaline, I-type granitoid plutons are iron-rich and metaluminous, and commonly display charnockitic facies. Such intrusions are the source of beryl-rich pegmatites, generally crystallized inside the parent pluton, that produce large amounts of gem-quality aquamarine. Alexandrite, a Cr-bearing crysoberyl, formed in hydrothermal systems involving peraluminous metasediments and ultramafic rocks, intruded by S-type granites, and percolated by beryllium-rich fluids emanated from those granites. Emerald occurs in quartz-feldspar veins and disseminated in phlogopite-amphibole schists, in shear zones bounded by thrust faults, associated with ultramafic rocks. Although these deposits may be related to hydrothermal alteration linked to the Cambrian igneous activity, their direct relation to granites was not completely demonstrated.