LITHIUM-RICH PEGMATITES FROM EASTERN BRAZIL: AN APPLIED STUDY OF GRAIN SIZE VARIATIONS

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In eastern Brazil, the largest reserves of lithium minerals occur in pegmatites situated in the Araçuaí Belt, northeastern Minas Gerais State. Of these minerals, spodumene stands out as the main raw material for producing lithium composites, being exploited in the Cachoeira Mine (Companhia Brasileira de Lítio), located between Araçuaí and Itinga towns. The source of these pegmatites is an intrusive, peraluminous, S-type granite, crystallized in Cambrian time (530 Ma). The pegmatites are tabular, discontinuous, non-zoned, large bodies emplaced in Neoproterozoic metasediments, along medium- to high-angle surfaces, corresponding to the NW-dipping schistosity and a system of SE-dipping fractures. They essentially consist of K-feldspar, albite, quartz, spodumene, and muscovite. Montebrasite, beryl and cassiterite are common accessory minerals. Spodumene grain size increases gradually from base to top inside the pegmatite bodies. Preferential concentrations of coarse grained spodumene is considered to occur as a result of the accumulation of rising aqueous fluids in the upper portions of the bodies or in places where pegmatites display a shallow dip, owing to the drop in viscosity and nucleation density. Potassic feldspar samples were selected for geochemical monitoring. Their K/Rb and K/Ba ratios decrease systematically from the base to the top, in the same direction as the increase in the grain size is verified. As grain size was the main factor of economicity for spodumene ore at that mine, our studies helped in understanding the grain size variation and planning the exploitation works.