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Margarite-corundum schists and topaz schists: metamorphic products of Mesoproterozoic oceanic high-sulfidation systems, Serra do Itaberaba Group, SP

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In the central portion of the Ribeira fold belt, southeastern Brazil, the Mesoproterozoic volcanosedimentary Serra do Itaberaba Group was affected by two medium-grade regional metamorphic events and by a third low-grade retrometamorphic event. This succession was deposited in an ocean basin having N-MORB type basalts that evolved to a back-arc environment. Within the group four occurrences of alumina-rich rocks are now known (Guaviruba, Pedra Branca, Itaberaba and Pico Pelado), which crop out as small lenses intercalated between metabasites and metamorphosed volcanoclastic rocks, tuffs and pelites. Their genesis is related to oceanic magmatic-hydrothermal activity in the back-arc environment that was associated with the emplacement of small rhyolitic bodies and high-sulfidation gold mineralization. X-ray diffraction analysis (XRD) of 15 very fine-grained alumina-rich samples permitted corundum, topaz, margarite, rutile and an undifferentiated mica (possibly sericite) to be identified. Mineral associations allow recognition of two advanced argillic alteration events and a third carbonation or retrometamorphic event that affected rocks of the Serra do Itaberaba Group: the first event generated protolith 1 rich in aluminum oxides ± alunite that after metamorphism produced dark blue lithotypes composed of corundum ± sericite; the second event was a silicification event that produced protolith 2 composed of topaz + zunyite + alunite ± rutile or of andalusite+alunite, with metamorphic products corresponding to brown and whitish lithotypes (Pico Pelado occurrence); during carbonatization or retrometamorphism, margarite crystallized after andalusite, cyanite or sillimanite. The sum of these three events produced, after the metamorphism or retrometamorphism, brown, whitish, and heterogeneous lithotypes composed of margarite or of margarite + sericite ± corundum (Guaviruba and Pedra Branca occurrences). The identification of similar lithotypes during field work represents a potentially very valuable tool in mineral exploration works as they comprise rock guides for finding gold deposits in medium-grade metamorphosed volcanosedimentary sequences.

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Key words: Serra do Itaberaba Group; advanced argillic alteration; silicification.