Mineralogical and geochemical variations in the kaolinite and bauxite deposits at Itatiaia Alkaline Complex, RJ, Brazil.

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Remarkable mineralogical and geochemical contrasts can be recognised in the Itatiaia Complex. Such differences are some of the criteria to define the four geomorphologic domains. Distinct variations in the saprolite and soil colours and the thickness of the alteration zones were clearly affected by the climatic factors. Relief is also one of the main responsible for the reported changes. The highland domain (up to 2300m) consists of rugged topography formed by unweathered syenite and quartz syenitic rocks and incipient saprolitic zone composed of abundant kaolinite, subordinate related phases and negligible amounts of gibbsite, restricted to altered nephelinite dikes. The transitional domain (2100-2300m), at Massena, is characterised by a gentle plateau with slight gibbsite increase at the upper parts overlying kaolinite and considerable development of goethite occur. Biotite and its alteration product, chlorite (clinochlore and penninite) are distributed in the lower part of the gibbsitic horizon and associated with the goethite duricrusts. The following relief compartment, the lateritic domain (1800-2100m), at Macieira, forms a gentle plateau covered by autochthonous red bauxite. Kaolinite contents are less than 15%. An unusual enrichment of Fe and Ti, accompanied by the increase in the REE is typical in this and in the following domain. In the talus domain (lower than 1800m) the relative proportions of kaolinite and gibbsite are considerable variable.