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LATERITIC WEATHERING EFFECTS OVER PHOSPHATIC BRAZILIAN ORES: CATALÃO I AND JUQUIÁ (BRASIL)

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Carbonatitic massifs are responsible for 95% of Brazilian phosphatic ores actually mined, most of them related to residual lateritic mantle. Igneous origin and lateritization influence are the great differences from phosphatic ore from the other parts of the world, where they are mainly formed by sedimentary processes.

Lateritization over these apatite-rich igneous rocks increases P_2O_5 contents and promotes textural, morphological and mineralogical modifications, either in the whole ore as in individual grains, which are disadvantageous to industrial processes for ore concentration. After total dissolution of primary apatite, recycling of P leads to the formation of several generations of supergene phosphates, both apatitic and non apatitic, with a wide range of variation of textural, morphological and chemical features.

Catalão I and *Juquiá* are examples of Brazilian phosphatic ores, enriched by lateritization, each one having their own geological and mineralogical features; some aspects are common to both, other are quite different. This paper presents a textural, morphological and chemical characterization of the phosphatic ore and apatitic minerals from both massifs.

Apatite is mainly associated to carbonatitic rocks in both cases. At *Catalão*, carbonatite forms veins crossing earlier silicatic alkaline rocks, unlike *Juquiá*, where carbonatite is individualized in a 2km continuous body.

The P_2O_5 average contents in the fresh rock and in the lateritic ore are higher at *Juquiá*, where it

reaches, in the weathered rock, 34% weight % P_2O_5 , with 28% in average for the richer zones, and 16% for the whole ore. In this particular situation, enrichment industrial processes are not necessary, and the lateritic morphological and textural modifications does not represent a problem in ore utilization. *Juquiá* lateritic ore represents an extreme case of favourable conditions, with lithological homogeneity and P_2O_5 richness. The continuity of the carbonatitic body protects the lateritic mantle from Al participation in secondary phosphatogenesis: this does not occurs at *Catalão*.

At *Catalão*, the average contents reaches 9 weight % P_2O_5 in weathered rock, but, on unlike *Juquiá*, the chemical and morphological heterogeneity of phosphate phases, both primary and supergene, and the textural features of weathering origin, may lower the quality of the ore with respect to industrial processes of concentration and solubilization.