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REE in Brazil –condition of formation and types of deposits

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The REE pertains to two series (Lantanides, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb and Lu) according to increasing number and atomic masses and Actinides corresponding to U, Th, Pa and decay products, which are still not economically important for private activities. Brazil possesses larges reserves of REE concentrated in several geological environments and conditions. Some of these deposits correspond to the Nb-rich and Phosphate-rich Araxá Carbonatite Complex, exploited for four decades. The other deposits are represented by the monazite-rich placers with zirconite as the main products, ilmenite, rutile and secondarily siliceous sands and garnet. Investments in Brazil are poorly developed because of lack of technology and wrong governmental policies. Coastal placer deposits are monazite-rich containing most of above listed REE constituents, consequently forming one of the important Brazilian sources, explored since the beginning of last century. The circular structure of Monte Alegre at Pará State is structured in Paleozoic shales and contains values in U3O8 (300-1800ppm), ThO2 (850-1800ppm) and La2O3 (0.1-0.7ppm important contents of REE (CeO2=0.3-1.0ppm and 0.1-0.0.7ppm) and is deeply weathered. The quartzites of Serra de Itiuba (Bahia) revealed important concentrations of cheralite, monazite and Fe-autunite with significant grades of REE. Cryolite deposits of Pitinga (Amazon), exploited for Sn and Nb since the beginning of 1970, contain 0.03%Y2O3 and 0.036%HREE, mostly in the mine tailings. Pirochlore itself consists of 0.25%Y2O3 and in the metallurgical product, remaining in the storage sites several tons of material reach 2-3%REE exist. Euxenite and samarskite from pegmatites of Serra do Pangarito (MG) are rich in REE (13%Y2O3 from the total of REE=37%). In pegmatites from Sabinópolis, Divino do Ubá and Generosa the grades of Y2O3 (12.1-28.6%), Ce2O3 (0.81-8.62%) attain in samarskite, but significant values are obtained in the pegmatites from Rio Pomba (MG) in the range 7-29% REE-oxides. In the pegmatites from the Serra da Mesa (Goias) the grades in REE varies from 0.03-4.76% Y2O3 and 0.04-4.35%Yb2O3 in ixiolite and Ti-ixiolite. Another impostant area with pegmatites and alluvial deposits is the Rio Tajaui (Amapá) in uranothorianite (0.2-0.5%La2O3 and 0.4-0.6% Nd2O3) in an unexplored region. The albitites of Espinharas (Paraiba State) contains high grades of La (2.7-195ppm), Ce (3.2-220ppm), Pr (0.33-29.9ppm), Nd (1,1-88.5ppm), Sm (0.5-37.9ppm), Eu (0.05-7.11ppm), Gd (0.63-51.7ppm), Tb (0.09-12.9ppm), Dy (0.55-12.5ppm), Ho (0.09-34.1ppm) Er (0.25-12.9ppm), Tm (0.05-15.8ppm) and Yb (0.3-88.7 ppm) indicating high potential for REE…

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