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Geological contribution to the Fongo Tongo bauxite formations (West-Cameroon)

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Fongo-Tongo found in the western region of Cameroon, is the second bauxite potential in this country. The present geological study of these bauxite deposits is aimed to identify these materials, and determine their morphological, mineralogical and geochemical features. Fongo-Tongo is topographically a high lands made up of plateau (>1645 mm) on which cuirasses are developed in form of massive flagstones and blocks. Those cuirasses are vesicular, alveolar, conglomeratic, and enclose nodules. The color is variable: red, reddish to reddish-brown, brown, pink, yellowish or ocher. Some cuirasses enclose violet stain and texture, while others are mottling greenish. In low land, they are discontinued and form small blocks with a grain size ranging from centimeter to meters. They are massive, red with some vesicles enclosing red unconsolidated materials. Mineralogically, those cuirasses are dominantly made up of gibbsite and goethite. Quartz, anatase, hematite, maghemite and kaolinite are trace. Geochemically, alumina (Al_2O_3) content ranging from 37.4 to 57.5 wt.% is dominant. Fe_2O_3 (<29.5 wt.%), TiO_2 (<7.5 wt.%) and SiO_2 (0.48-3.21 wt.%) contents are low. Those cuirasses enclose significant content for some trace and rare earth elements (Zr: 504-2310 ppm, Nb: 104-350 ppm, Sr: 0.7- 345 ppm, V: 8-667 ppm, Ce: 24.9-239 ppm, La: 2.4-144 ppm, and Nd: 3.1-126 ppm). From the geochemical point of view, cuirass occurring in Kreu, a locality found in the west of Fongo-Tongo has the highest Al_2O_3 (57.5 wt.%) content, and lowest SiO_2 (3.21 wt.%) and Fe_2O_3 (3.97 wt.%). They enclose low Zr, Nb, Sr, V, Ce, La, and Nd, and crop out in form of flagstones and discontinued blocks. Globally, bauxites with high alumina and low iron content, silica and titanium deplete have been found in Fongo-Tongo. Thus, the low impurities in bauxites from Fongo-Tongo upgrade their metallogenic importance. The exploitation of this deposit will result in significant environmental impacts in the locality.

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Volcanism and global Earth shrinkage

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Volcanism activities have a great direct influence on global earth shape and size. Within the framework of continuum mechanics, this paper presents the effect of volcanism activities on earth size that can be driven mathematically and proof earth contraction. This contraction is the major contributors for global earth shape and size changes. A hundred million cubic kilometers of volcano outcomes would decrease the radius of earth by less than 0.5 km approximately. As the volcanoes outcomes increase gradually, contraction accumulates gradually over time to be significant. That would result in very slowly but continuous changes in the position of the earth relative to the sun that has the most dominating influence on the changing climate of earth. The paper discusses the relationship between volcanoes outcomes and global earth shape and size changes.

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