

Physico-Chemical and Mineralogical Characterization of Some Bauxites from West Africa

Marie Constance Beavogui^{1*}, Viktorovna Loginova Irina²

¹Laboratoire de Recherche Appliquée en Géoscience et Environnement,
Institut Supérieur des Mines et Géologie de Boké, BP 84, Republic of Guinea

²Ural Federal University, Yekaterinburg, Russia

*Corresponding Author

ABSTRACT

West Africa is known for its rich bauxite deposits located in Guinea, Sierra Leone and Ghana to name a few. In Africa, the majority of reserves are concentrated in West Africa, which alone holds about 86% of African reserves. The richest bauxite deposits are in the Republic of Guinea, which hosts more than a quarter of the world's reserves. For the experimental tests, five types of bauxites were tested, including one type from deposits in Sierra Leone and four other different deposits from Guinea. The chemical and mineralogical composition of bauxite, which determines its quality, varies greatly depending on the deposits. The results obtained show that the Al_2O_3 content is in the range of 42%-53% and that of the silica between 2.49%-4.2%. Gibbsite is the predominant mineral and varies between 56.6%-80%. Boehmite is present in some types of sample (4.6%-6.2%), minerals such as aluminous goethite is characteristic in these bauxites which greatly influence the extraction of alumina by the Bayer process. In view of the chemical and mineralogical composition, the transformation of these minerals should support sustainable development in these countries.

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