

Mineralogical And Physicochemical Assessment Of Ihioma Coal In Imo State Of Nigeria

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Abstract

The physicochemical characterization of coal samples from deposits provides mineral distribution and composition data for utilization by scientists and policy makers. The characterization of coal samples of Ihioma coal deposits in Imo state, Nigeria was performed using proximate and ultimate analyses. XRD and ICP-AES were used to characterize the coal samples for potential energy utilization. Proximate analyse determined fixed carbon content and volatile matter to be 51.5% and 38.5% respectively, an indication of a good coking material. The carbon % in the ultimate analyses was at 64.6% while O₂, H₂, N₂ and S were all below 5% which showed the coal potential to emit lower emissions. ICP-AES chemical composition determined SiO₂ to be the most abundant followed by Na₂O. The XRD peaks classified Ihioma coal as having Quartz, Albite and Haematite. Material mapping by XRD showed that Al and Si were evenly distributed while S, Co and Fe were unevenly distributed. Thus Ihioma coal has features of ignition and can undergo spontaneous combustion, hence a good source of thermal energy. Results also confirmed Ihioma coal as a potential material for pigments and can be utilized for ceramics, pottery and ornaments.

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