J Material Sci Eng 2017, 6:10 (Suppl)
DOI: 10.4172/2169-0022-C1-089

Refractory properties of alluvial clay in the niger delta region of nigeria

S G Lawson-Jack
Federal University Otuoke, Nigeria

Type of Activity: Research work Bayelsa State, located in the central Niger Delta region of Nigeria is known to have abundant clay deposits. These clay deposits remain largely uncharacterized. In this study, alluvial clay deposits found along the banks of two major tributaries of the Niger River – Orashi and Nun rivers - were characterized for physicochemical and mineralogical properties. The objective is to determine their suitability for application as refractories which are used as insulators in the Electric Power grid. X-Ray Fluorescence (XRF) and Atomic Absorption Spectrometry (AAS) analyses showed that the mineralogical content of the clays are largely silica (SiO_2) - 54.62% and alumina (Al_2O_3) – 32.42% with some additions of iron oxide (Fe_2O_3) – 6.05% and alkaline earth oxides [potassium oxide (K_2O) - 2.23%, magnesium oxide (MgO) – 1.85% and calcium oxide (CaO) – 1.02%]. Physical property tests carried out following ASTM standards included particle size distribution, plasticity, bulk density, thermal shock resistance and thermal conductivity. Clay samples fired up to 1,200oC in an electric furnace showed that they are structurally stable with only minor changes in chemical composition. The physico-chemical properties of the clay samples indicated that they of the Kaolinite group with a high melting point (> 1,200oC) and high plasticity which make them suitable for refractory applications.

slawsonjack@nigatom.org