World Academy of Science, Engineering and Technology
International Journal of Geological and Environmental Engineering
Vol:13, No:06, 2019

Industrial Kaolinite Resource Deposits Study in Grahamstown Area, Eastern Cape, South Africa

Authors : Adeola Ibukunoluwa Samuel, Afsoon Kazerouni

Abstract : Industrial mineral kaolin has many favourable properties such as colour, shape, softness, non-abrasiveness, natural whiteness, as well as chemical stability. It occurs extensively in North of Bedford road Grahamstown, South Africa. The relationship between both the physical and chemical properties as lead to its application in the production of certain industrial products which are used by the public; this includes the prospect of production of paper, ceramics, rubber, paint, and plastics. Despite its interesting economic potentials, kaolinite clay mineral remains undermined, and this is threatening its sustainability in the mineral industry. This research study focuses on a detailed evaluation of the kaolinite mineral and possible ways to increase its lifespan in the industry. The methods employed for this study includes petrographic microscopy analysis, X-ray powder diffraction analysis (XRD), and proper field reconnaissance survey. Results emanating from this research include updated geological information on Grahamstown. Also, mineral transformation phases such as quartz, kaolinite, calcite and muscovite were identified in the clay samples. Petrographic analysis of the samples showed that the study area has been subjected to intense tectonic deformation and cement replacement. Also, different dissolution patterns were identified on the Grahamstown kaolinitic clay deposits. Hence incorporating analytical studies and data interpretations, possible ways such as the establishment of processing refinery near mining plants, which will, in turn, provide employment for the locals and land reclamation is suggested. In addition, possible future sustainable industrial applications of the clay minerals seem to be possible if additives, cellulosic wastes are used to alter the clay mineral.

Keywords : kaolinite, industrial use, sustainability, Grahamstown, clay minerals
Conference Title : ICMGCE 2019 : International Conference on Mining Geology and Coal Exploration
Conference Location : Toronto, Canada
Conference Dates : June 17-18, 2019