

Elaboration and characterization of physicochemical properties and mineralogical study of natural clay (M'sila area).

Karima Larkat^{1*}, Azzedine Benyahia¹, Meftah Allal², Nadir Deghfel³.

^{1*}Department of Chemistry, Laboratory of Inorganic Materials LMI Faculty of Science, University Mohamed Boudiaf - M'sila, Algeria

¹Department of Chemistry, Laboratory of Inorganic Materials LMI, University Mohamed Boudiaf, M'sila, Algeria

²Department of Civil Engineering, Laboratory of materials and structural mechanics Faculty of Technology M'sila University, Algeria.

³Department of Chemistry, Laboratory of Inorganic Materials LMI, University Mohamed Boudiaf, M'sila, Algeria

*warda.larkat@gmail.com

Abstract – Clays are used in a wide variety of fields (e.g. construction, pharmaceuticals, agriculture, etc.), motivating experts and scientists to study the physical-chemical properties of clays and their mineral composition, and to improve their use in their specific fields. Given its importance in the field of use, our research focused on studying the mineral composition of natural clays and their physical-chemical properties. Physical-chemical properties studied - we obtained only a yellow clay with a pH of 7.47, the W % of 1.38% is lower. The Ig swelling index (1.55%) swells slightly. The clay characterization method was revealed by FTIR in agreement with the results revealed by the analysis. The existence of kaolinite and quartz is well confirmed (Si-O bond deformation and Si-O elongation vibration band signatures of quartz located at 470.4 cm^{-1} , 712 cm^{-1} and $798, 4\text{ cm}^{-1}$). Kaolinite or Si-group quartz at 1025 cm^{-1}) The thermal stability of the clay was monitored by ATG thermogravimetric analysis, which made it possible to track the loss of sample mass as a function of temperature (total loss of clay was approx. 5.56%). the spectral analysis of the d X-ray diffraction (XRD) indicates that it is composed of quartz, calcite and dolomite, which explains why our clay is heterogeneous, the mineralogical composition of the clay fraction of our material is quartz (12.68%) and calcite (50.35%) The results of the elemental chemical analysis (XRF) show that silica (26.42%) and calcium oxide (28.58%) are the major oxides in our sample.

Keywords – Clay, Physical-Chemical Properties, Mineralogical Compositions, Chemical Compositions