THE IMPORTANCE OF NANOSTRUCTURE FOR THE SELECTION OF GEOMATERIALS

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Performance and price are always important in material selection. Throughout history, clay and clay minerals have been useful and versatile materials to mankind because of their unique chemical and physical properties. Thus, they have been and continue to be one of the most important industrial raw materials for our society which are widely utilized in many branches of industry. Sepiolite, $Mg_4Si_6O_{15}(OH)_2.6H_2O$, is an important geomaterial class with many industrial uses because of its unique properties, such as adsorption, chemical composition, high specific surface area, white color, good porosity, low specific gravity, catalytic properties, and thixotropy.

In this study, the characterization of nodular sepiolites (also known as meerschaum and/or white gold commercially) from Eskisehir province was studied in order to determine the cause of cracking in the sandy called-type meerschaum products reducing its performance and price drastically. X-ray diffraction (XRD) analysis, X-ray fluorescent (XRF) analysis, scanning electron microscopy (SEM), and Brunauer–Emmett–Teller (BET) was used to identify, study and characterize the samples. According to the analysis results, the two types of meerschaum exhibit significant differences in their SEM and BET analysis. Thus, it is concluded that the nanoscale structure of sandy meerschaum was the main factor for its cracking.