

Lower Cretaceous Clay in Anti-Lebanon Mountains, Syria and their Importance in Ceramic Manufacturing

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Abstract : The Lower Cretaceous rocks are exposed only in the mountains regions of Syria, such as the Anti-Lebanon mountain on the western side of Damascus. The lower cretaceous sequences are made up of different rocks. The upper and middle parts of the section are composed mainly of carbonate sediments and, less frequently, gypsum and anhydrite. The lower beds are mainly composed of sandstone, conglomerate and clay. Clay samples were collected from the study area, which is located about 45 km west of the city of Damascus, near the border village of Kfer Yabous and to the left of the Damascus - Beirut International Road, within the lower Cretaceous upper Aptian deposits. The properties of clay were carried out by X-ray diffraction (XRD) and, X-ray fluorescence (XRF) and Thermal Analysis (DTA-TG-DSC) techniques. The studied samples of clay were mainly composed of kaolinite, quartz, illite. Chemical analysis shows the content of SiO₂ varied between 46.06 to 73 % Al₂O₃ 14.55-26.56%, about the staining oxides (Fe₂O₃ + TiO₂), the total content is about 4.3 to 12.5%. The physical properties were determined by studying the behavior of the body before and after firing, showed low bending strength values (22.5 kg/cm²) after drying, and (about 247 kg/cm²) after firing at 1180°C, water absorption value was about 10%. The cubic thermal expansion coefficient at 1140°C is 213.77 x 10⁻⁷ /°C. All of the presented results confirm the suitability of this clay for the ceramic industry.

Keywords : anti-Lebanon, Damascus, ceramic, clay, thermal analysis, thermal expansion coefficient

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