Origin and Geologic Evaluation of Umm Ar Razam Clays
Al Faidiyah Formation, NE Libya

Abstract
The study area is located in and around Umm Ar Razam village, about 50 Km east of Darnah city, north-eastern Libya. In this study many claystone sections were studied. These claystones belong to the lowermost part of Al Faidiyah formation of Upper Oligocene – Lower Miocene age. The studied sections consist of claystone beds ranging in thickness about 10 meters. These bentonitic clays are generally grey to greenish grey in colour, with popcorn – like appearance. They have a waxy character and are exposed sporadically in this area as isolated outcrops. They might be deposited in lagoonal, lacustrine or shallow marine environment. The main purpose of this thesis is to study the origin and to evaluate the Umm Ar Razam bentonitic clays. For example, lithology, mineralogy, the chemical composition, crystal forms and habits, physical properties, industrial uses and treatment will be investigated. The Results showed that these clays consist of the minerals Na- montmorillonite, Kaolinite, and Illite. Non – clay minerals includes quartz, calcite, dolomite, gypsum, halite, muscovite, rutile, sanidine, and tridymite. Moreover, clay mineral fraction studies using the different techniques showed that these bentonitic clays were formed due to in situ alteration of volcanic ash in subaquous environment. Evidences for such an occurrence include mineralogical evidence as the existence of high temperature minerals as sanidine, rutile, and tridymite. The existence of unaltered volcanic ash as seen from SEM photomicrographs also supports this origin. Furthermore, XRF results showed downward depletion of silica right below these bentonitic clays 6 in calcarenite beds of Al Abraq formation. XRF results also showed that the Umm Ar Razam bentonites are in accordance with the American bentonites and the parent material of such bentonites came from basic volcanic ash materials. In addition, the viscosity and the filtration of Umm Ar Razam bentonite is nearly identical with the international bentonite by adding (Soda Ash) and (Na2SiO3 ) with special treatment method. The cost of the Enhanced Umm Ar Razam bentonite is less than of the imported bentonite cost. Based on the
physical and chemical properties these bentonites can be used in many industries especially as building materials and drilling fluids.