

MINERALOGY OF LAKE BOTTOM SEDIMENTS AND GEOLOGY OF THE KÜÇÜKÇEKMECE LAKE DRAINAGE BASIN, ISTANBUL, TURKEY

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The oldest lithostratigraphic unit underlying of the Küçükçekmece Lake drainage basin is the Trakya Formation of Lower Carboniferous age. This unit is composed of sandstone, siltstone, and shale turbidites. The next younger unit is the Kırklareli Formation a folded section of Eocene age composed of reef limestone. This unit covers a large area, and its typical outcrops are located near Arnavutköy, and in the vicinity of Sazlı stream dam. Overlying the Kırklareli Formation is the Sazlıdere Formation, a clay - bearing limestone unit. The next younger unit is the Gürpınar Formation Oligocene - Miocene age sand and limestone extending to 1 km. south of Esenyurt, and with outcrops across the western parts of the Küçükçekmece Lake. Next younger is the Çukurçesme Formation composed of silt, sand and gravels exposed at the eastern and western parts of Küçükçekmece Lake. The latter unit is overlain by the Bakırköy Formation, a clay - bearing limestone unit. In this study, Lake Bottom sediment samples have been collected from a boat systematically at every 1 km². Bottom sediments were taken approximately 500 - 1500 gram from the sample locations. After drying Lake Bottom sediment samples at 105°C, ASTM E 11-81 (USA) Retsch brand screen set was used for sieve analysis. Sieve analysis most sediment on the bottom of Küçükçekmece lake gravelly sand terms in of grain size. Contents of clay size materials ratio are very low in bottom sediments, varying between 0.01% and 3.22%. Based on Folks (1974) classification, the fifteen samples are gravelly sand, four samples are slightly gravelly sand, one sample is sandy gravel and one sample is sand. Gravel and sand size materials are evenly distributed over the Lake Bottom, but silt and clay size materials are mainly concentrated at shores. Mineralogical compositions of bottom sediments in Küçükçekmece Lake were determined by XRD (X-ray diffraction). Sediments are primarily composed of quartz, calcite, plagioclase, and aragonite. The clay sizes fractions and composed of smectite, illite, kaolinite, and chlorite. Sediments at stream mouths contain quartz, calcite, plagioclase, smectite, kaolinite and illite. As a result of clay separation process in bottom sediments, it was found that smectite, illite, kaolinite, and chlorite are clay minerals incorporating with settling. When it is taken into consideration that the source basin for sediments into Lake includes mainly clay minerals such as sandstone, limestone, gravel, sand, silt and various clays, it is derived that clay patterns are in harmony.