The Mineralogy and Geochemistry of the Uppermost Sediments of the Lake Hovsgol, North Mongolia: It's Implication to the Paleoenvironmental Changes

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Abstract : One short core with length of 146cm(HB-107), at coordinates of N51°11′37.5″; E100°24′45.6″, from 229m water depth was subject of the present study. The sub-samples of the core were analyzed for the water contents (WC%), biogenic silica, identification of the main phases, grain size distribution, geochemistry and some physical properties of sediment(Wet density and Magnetic susceptibility) with aims of recording palaeo-environmental changes in Northern Mongolia. The evaluation of the geochemical and mineralogical proxies on palaeo-climate and palaeo-environmental changes are based on comparison to the behavior of biogenic silica through core, as later one had been showed itself, as good indicator of the climate and environmental fluctuation.

Age model of the investigating core based on previously C 14 dated core HB105 taken from the central part of the Hovsgol Lake and the result had been published elsewhere.

The core consists of two litological varieties: upper diatomaceous silt, lower clay. According to the age model the upper diatomaceous silt formed during the Holocene, lower clay- during the late Pleistocene glacial period.

The geochemistry and phase identification analysis on the core samples are resulted in determining main minerals that form the bottom sediments and their geochemistry. The main minerals include quartz, feldspar, muscovite, clinochlore, amphibole and carbonate phases(dolomite and calcite). Through the core not only occur the relative quantitative changes of the main phases, but also happen that the carbonate phases completely disappear in diatomaceous silt. This is believed to be related to the lake water salinity changes, which occurred during the transition period from Pleistocene glacial-to the Holocene interglacial. These abrupt changes of the mineralogy have been clearly traced in geochemistry of sediments, specially in calcium concentration, which is high in lower clay and low in upper diatomaceous silt. That means, geochemistry and mineralogy of the bottom sediments can be used as proxy data on palaeo-climate and palaeo-environmental changes.

Key Words : core base, upper diatomaceous silt, lower clay, paleoclimate