

## Chemical composition of lacustrine sediment from Lake Hovsgol, Mongolia : Implication of sedimentation change for the last 27kyr

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The lacustrine sediment records environmental changes occurring in not only global but also regional scales. In this study, the nineteen elements, total inorganic carbon (TIC) and total organic carbon (TOC) were analyzed for bulk sediments core of Lake Hovsgol from last glacial period to the present. The mineral composition was measured to restrict the sedimentation mechanism of each element. In addition, Principal Component Analysis (PCA) was performed to describe the similarities among the twenty-one components. They could be classified into four types. Type 1 is characterized by Na<sub>2</sub>O, MgO, CaO, Sr and TIC, which is included mainly in carbonates. Type 2 is characterized by Al<sub>2</sub>O<sub>3</sub>, K<sub>2</sub>O, TiO<sub>2</sub>, Fe<sub>2</sub>O<sub>3</sub>, Rb, Ba and Pb, which is included in terrigenous minerals. Type 3 is characterized by V, Ni, Cu, Zn, Cs and TOC reflecting bioactivity. Type 4 is characterized by Cr, Mn and As reflecting redox condition in sediment. Carbonates are negatively correlated with components reflecting bioactivity. Carbonates decreased from the end of the last glacial period to the beginning of the postglacial period, whereas components reflecting bioactivity increased in this period. The decrease of carbonates is considered that carbonates was dissolved by CO<sub>2</sub>, which was generated by the decomposition of organic matters. Principal Component 1 (PC1), which is characterized by carbonates and components reflecting bioactivity, gradually decreased from 18,100 cal yr BP and abruptly decreased for 2,200 yr from 12,000 to 9,800 cal yr BP after the Younger Dryas period. This variation shows the characteristic response of Lake Hovsgol to Milankovitch forcing. PC2, which is characterized by terrigenous minerals, change a periodicity of about 8,700-yr cycle irrespective of a period of climate transition including from the last glacial period to the postglacial periods. The sections increasing PC2 approximately correspond with the sections which are the higher median grain size of quartz in Loess Plateau and are abundance of magnetic minerals in Lake Huguang Maar. Thus PC2 is considered a proxy of winter monsoon.