Geophysical Research Abstracts, Vol. 9, 08041, 2007
SRef-ID: 1607-7962/gra/EGU2007-A-08041

Paleoenvironmental history of the Eastern Arctic Ocean during the last 200 ka

S.I. Nam (1), J.J. Bahk (1), S.W. Chang (1), S. Yi (1), H.K. Lee (2), R. Stein (3), J. Matthiessen (3) and C. Vogt (4)

(1) Korea Institute of Geoscience and Mineral Resources, Daejeon, Korea, (2) Department of Industrial Chemistry, Sangmyung University, Seoul, Korea, (3) Alfred-Wegener-Institute for Polar and Marine Research, Bremerhaven, Germany, (4) ZEKAM, University of Bremen, Bremen, Germany (sinam@kigam.re.kr / Fax: +82 42 868-3417 / Phone: +82 42 868-3384)

Detailed multi-proxies, i.e. stable isotopes of planktonic foraminifera *N. pachyderma* sin., organic-geochemical bulk parameters (C/N_{org} ratios, stable carbon and nitrogen isotopes of organic matter and rock-eval pyrolysis), bulk mineralogy and grain-size distribution (including IRD contents) were investigated on two sediment cores PS66/321-4SL and PS66/325-3SL taken from the eastern Arctic Ocean during the "Polarstern" ARK-XX/3 expedition (2004). The main objective of this study is to reconstruct late Quaternary glacial history and paleoceanographic changes along the Svalbard continental margin underlying the Atlantic water inflow. In particular, organic-geochemical proxy data were used to delineate characteristics and origin of organic matter being deposited in the glaciomarine sediments.

The stratigraphic framework of investigated sediment cores is primarily based on AMS-^{14}C dating, oxygen and carbon isotope measurements on the planktonic foraminifera *N. pachyderma* sin., occurrence of *P. bulloides* (Holocene, MIS 5.1, 5.5) together with physical properties and magnetic susceptibility (MS) which are commonly used for lateral core correlation in the Arctic Ocean. Based on this combined stratigraphic framework, core PS66/325-3SL, retrieved from the northern continental margin of the Barents Sea (ca. 896 m water depth) may represent a geological history over the last 100 ka, while PS66/321-4SL, was taken in the deep-sea east of the Yermak Plateau (ca. 2359 m water depth) appear to extend back to the MIS 6/7?. Moreover, both sediment cores well record paleoenvironmental changes in terms of the repeated waxing and waning of Svalbard/Barents Sea ice sheet (SBIS), Atlantic water

inflow and sea-ice coverage over the last 200 ka. In particular, a couple of pulses of maximum IRD supply occurred during MIS 6, 4/3, 2 and T1. The IRD pulses along with markedly enhanced amounts of sand fraction ($>63\mu$m) may reflect advances/retreats of the near-by Svalbard-Northern Barents Sea Ice sheet. Furthermore, glacial stages are distinctly characterized by increased TOC coinciding with higher C/N$_{org}$ ratios, light δ^{13}C$_{org}$ values (<-24.5‰) and δ^{15}N$_{org}$ values (<6‰), reflecting enhanced supply of terrigenous organic matters to the Arctic Ocean. In contrast, interglacial stages, i.e. Holocene and MIS 5.5 reflect to some extent increased productivity in the surface water, supported by low C/N ratios (<15) and relatively heavy δ^{13}C$_{org}$ values (>-24‰) and δ^{15}N$_{org}$ values (>7‰).