

Reconstruction of historical trends of and persistent organic pollutants during Anthropocene in the sediment core from Southern Ocean

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Abstract

The historical trend of polyaromatic hydrocarbons (PAHs) and persistent organic pollutants (POPs) in the 68 cm of sediment from Northwestern Weddell Sea was determined. This region is known as high primary productive because of spring diatom bloom, and the sinking rate of particles from the sea surface to the bottom is around 10-100 m per day. The core would reflect 34-68 yr of the historical trends, as the sedimentation rate is expected ranged from 0.5 to 1 cm/yr. Therefore, this sediment core preserves the historical trend of Long-range transporting Pollutants, such as polyaromatic hydrocarbons (PAHs) and persistent organic pollutants (POPs) in the atmosphere and surface sea water during the Anthropocene. The particle size, water content, TOC, IC, C/H/O, diatom species will be analyzed in the Korea Polar Research Institute, and age of the core layer will be determined with ²¹⁰Pb analysis. The previous yearly- to decadal-based short-term atmospheric data and global atmosphere-ocean fate model was compared and integrated with the data from this study. In addition, the eliminating capacity of Southern Ocean for PAHs and POPs was estimated by sinking flux. The result of this study illustrates long-term trend of the background PAHs and POPs concentrations in the Southern Ocean and Antarctica. In addition, it will be helpful to understand and quantify the fate of PAHs and POPs in the global environment.

Keywords: *Persistent Organic Pollutants, historical trend, Sediment Core, Anthropocene*

Biography

Ph.D. Jun-Tae Kim studied Chemistry in Yonsei University (B.S.) and got the Ph.D. degree of Environmental Analytical Chemistry in POSTECH (2016). After graduation, he worked as postdoctoral researcher in Korea Polar Research Institute (KOPRI) for two years, and then in Max Planck Institute for Chemistry in Mainz. He interested in behavior and fate of organic pollutants in the environment, and their exposure and effect to human and ecosystem.