



Evaluation of long range transport of fossil fuel originated organic aerosol at a background site in Northeast Asia

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Northeast Asia is heavy air pollution region due to usage of large amounts of fossil fuel. In addition, meteorological conditions represented as prevailing westerlies in Northeast Asia region causes long range transport of anthropogenic pollutants emitted from China to Korea and Japan and even the United States across the Pacific Ocean (Bey et al., 2001).

The Baengnyeong Island of Korea is located at the northwestern part of the Korean peninsula and close by North Korea and China, thus this site is regarded as an ideal place for background air measurements in Northeast Asia. Also, it has low local anthropogenic emissions and is frequently influenced by various air masses from China and North Korea in the Island. In this study, we performed intensive sampling during summer and winter in the Baengnyeong Island and analyzed various organic compounds including fossil fuel originated organic markers such as hopanes and PAHs using thermal desorption two dimensional gas chromatography with time of flight mass spectrometry (TD-GC×GC-TOFMS). We also analyzed ~20 urban aerosol samples collected at Seoul, a representative urban site in Northeast Asia region to compare organic compounds distributions of aerosol samples at the Baengnyeong Island. By applying air mass back trajectory analysis and comparing organic compounds distributions in aerosol samples of the Baengnyeong Island and Seoul, the impact of long-range transport of fossil fuel originated organic pollutants at a background site in Northeast Asia were evaluated.

(References)

Bey, I., Jacob, D.J., Logan, J.A., Yantosca, R.M., 2001. Asian chemical outflow to the Pacific in spring: origins, pathways, and budgets. *Journal of Geophysical Research-Atmosphere* 106, 23097-23113.