1.247 Sources and atmospheric processing of PM2.5 carbonaceous and nitrogen aerosols in Northeastern China and the Yellow Sea during the KORUS-AQ campaign: Preliminary results of isotopic study.

Early Career Scientist

Presenting Author:
Saehee Lim, Dept. of Earth and Environmental Sciences, Korea University, 02841 Seoul, South Korea., saehee.lim@gmail.com

Co-Authors:
Xiaona Shang, Dept. of Earth and Environmental Sciences, Korea University, 02841 Seoul, South Korea.
K. Zhang, State Key Laboratory of Environmental Criteria and Risk Assessment, Chinese Research Academy of Environmental Sciences, Beijing 100012, China.
X. Yang, State Key Laboratory of Environmental Criteria and Risk Assessment, Chinese Research Academy of Environmental Sciences, Beijing 100012, China.
C. I. Czimczik, Earth System Science, University of California, Irvine, CA, USA.
Meehye Lee, Dept. of Earth and Environmental Sciences, Korea University, 02841 Seoul, South Korea.

Abstract:

Most source apportionment studies in China using isotopic analyses have been carried out in cold season when severe haze events often occur. We measured the radiocarbon, stable carbon, and stable nitrogen isotopic composition of $PM_{2.5}$ at two urban sites (Beijing; 40.04N 116.42E and Dalian; 38.51N 121.37E) and a background site (Changdao; 38.18N 20.74E) in China and over the Yellow Sea, between May and June in 2016 during the KORUS-AQ campaign. Fraction modern (f_M) of total carbon (TC) determined from ^{14}C analysis was 0.48±0.06 (n=31) and 0.51±0.11 (n=9) in Beijing and Changdao, respectively, indicating equal contribution of both fossil and non-fossil sources. The $\delta^{13}C$ of TC in Changdao shows slightly higher values, probably related to its atmospheric processing during transport from source areas, while overall $\delta^{13}C$ of TC varied little with a mean of –25.0±0.4‰ in between sites. The largest site-by-site variability in isotopic composition was observed for $\delta^{15}N$ of total nitrogen (TN) with a mean of 7.8±3.6‰. The $\delta^{15}N$ tended to decrease from Beijing (10.6±1.8‰) to the Yellow Sea (1.0±2.3‰), reflecting different emission sources, formation mechanisms and atmospheric processing of nitrogen species. Further results will be presented in the meeting.