

Measurements of physical and chemical properties of urban aerosols and their CCN activities in Seoul during the KORUS-AQ pre-campaign

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Interest in cloud condensation nuclei (CCN) has been increasing for the last few decades due to their first order effects on radiative and microphysical properties of clouds. Particularly, scientific understanding of CCN from anthropogenic sources becomes important because it is now considered that large uncertainties in climate change predictions stem from insufficient understanding of CCN. CCN activity is influenced by size and chemical component of aerosols. The KORUS-AQ campaign, jointly organized by National Institute of Environmental Research (NIER) of Korea and National Aeronautics and Space Administration (NASA), aims at understanding various aspects of air quality problem in Korea and will be held in spring, 2016. In preparation for this campaign, pre-campaign was held during May 18-June 13, 2015, in Seoul where numerous local anthropogenic sources exist and influence of Chinese continental outflow directly affects. Here we present some of the important results from the pre-campaign. Chemical properties of aerosols were measured with AMS. Aerosol and CCN number concentrations, aerosol size distribution and aerosol hygroscopic growth factor were measured by CPC, CCN counter, SMPS and H-TDMA, respectively. Average diurnal variation of aerosol number concentration showed three dominant peaks at around 0600 UTC and morning and evening rush hours. Each peak seemed to have different characteristics and therefore detailed analyses of physical and chemical properties of aerosols during the peaks as well as during some special events will be made. The hygroscopicity parameter, kappa, will be estimated by examining CCN activity, H-TDMA measured hygroscopic growth factor and mixing rule of aerosol chemical components, and the result will be compared as well.

Key words: urban aerosol, hygroscopicity, CCN activity, KORUS-AQ pre-campaign