

AAS005-04

Room: 201B

Time: May 27 09:45-10:00

Measurement of elemental carbon at CHAAMS in spring 2009

Akinori Takami^{1*}, Naoki Kaneyasu², Kazuo Osada³, Shuichi Hasegawa⁴, Kei Sato¹,
Atsushi Shimizu¹, Shiro Hatakeyama⁵

¹NIES, ²AIST, ³Nogoya-U, ⁴CESS, ⁵TUAT

Rapid development in East Asia leads to the increase of emission. In spring time, gaseous and particulate matters are transported from Chinese continent to Japan. Elemental carbon (EC) is black so that it absorbs the solar radiation in the atmosphere causing the change of radiation balance. We measured EC in Cape Hedo Atmosphere and Aerosol Monitoring Station (CHAAMS) and EC fractions were calculated for both PM2.5 and TSP.

Chemical compositions in PM2.5 particulate matters were measured using an aerosol mass spectrometer and a carbon monitor (RP5400). Mass concentration of PM2.5 was measured by TEOM. Chemical compositions in TSP particulate matters were collected using a high volume sampler and inorganic species were measured using an ion chromatography and EC and organic carbon were measured using a carbon analyzer (DRI).

Measurement period was between March 28 and April 16 in 2009. Mass concentration of PM2.5 was varied periodically and maximum concentration was about 40 $\mu\text{g m}^{-3}$. The main species were sulfate, ammonium and organics. EC fraction was about 1-2% and concentration was at most a few $\mu\text{g C m}^{-3}$. Mass concentration of TSP was also varied periodically and maximum concentration was about 60 $\mu\text{g m}^{-3}$. The main species were sulfate, sodium and chloride. Calcium ions were little, indicating that sea salt was mainly component in TSP. EC fraction was about 2-3% and the highest EC fraction was recorded to be 6%. EC mass concentration was at most a few $\mu\text{g C m}^{-3}$. It was found that EC fraction was sometimes high in TSP although EC was considered to be in fine particles. This is important findings to consider the absorption by EC.

According to the back trajectory calculation, the air masses were transported from Korea, Taiwan, Yellow sea when EC fractions were high.

Keywords: elemental carbon, PM2.5, TSP, EC Fraction