

4.252 Measurement of the Electrostatic Charging State of Ambient Aerosol using a Parallel Electrode Plate Device.

Early Career Scientist

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Abstract:

In recent years, the influence on health by fine aerosol particles such as PM_{2.5} has been concerned. Especially regarding the particle deposition in a human airway, some previous researches showed that charged particles were deposited to airway surface several times as much as uncharged particles. In other words, when we inhale an aerosol particle, it is deposited on the airway more than expected from its particle size if the particles are charged. However, little knowledge on the electrostatic charging state of atmospheric aerosols has been obtained so far. Therefore, in this study, we measured the electrostatic charging state of atmospheric aerosols from April 2017 using a parallel electrode plate device utilizing the principle of electric mobility. The results varied depending on the measurement day, and the proportion of charged particles was about 75~88%. By investigating the relationship between the electrostatic charging state and the weather condition at the time of measurement, it was found that there was a strong positive correlation between the proportion of charged particles and the absolute humidity. In order to investigate the relationship between the proportion of charged particles and the absolute humidity in detail, continuous measurement of the electrostatic charging state was conducted at the time of rainy weather in which the absolute humidity easily changed.