

Comparison of Chemical and Physical Properties Between $PM_{2.5}$ and $PM_{>2.5}$

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Fine particulate matter ($PM_{2.5}$) have been recently paid attention more in environmental and health research due to their negative effects on human health, air quality, and climate changes. Although numerous studies have been conducted to quantify and characterize the $PM_{2.5}$ with source identification, their chemical and physical properties were incompletely understood. This study is addressed to compare the physical and chemical properties between the $PM_{2.5}$ and other size fractions of atmospheric particles (i.e., $PM_{>2.5}$), and evaluate qualitatively the contribution of $PM_{2.5}$ to environmental pollution. The collected $PM_{2.5}$ and $PM_{>2.5}$ samples showed blackish, and dark brownish colour, respectively. The $PM_{2.5}$ particles contain approximately $10 \mu\text{g}/\text{m}^3$ carbonaceous aerosols consisting of 90% organic and 10% black carbon (BC). The BC, interestingly, were observed more frequently in the $PM_{>2.5}$ samples rather than $PM_{2.5}$, based on X-ray imaging and SEM analyses. The $PM_{2.5}$ particles contributes >50% of harmful metal component contents such as Cd, Zn, and Cr compared to other atmospheric aerosols.