1.022 Characteristics of PM2.5 in India Collected by High-volume PM2.5 Particle Sampler.

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Abstract:

Compared with the coarser atmospheric particles, fine particulate matter (<2.5 μm in aerodynamic diameter; PM2.5) has characteristics of smaller particle size, easier to inhale in the respiratory system, so it has great influence on human health and atmospheric environment quality. The influence on human health ranges from minor upper respiratory irritation to chronic respiratory and heart disease to lung cancer. In addition, short- and long-term exposures have also been linked with premature mortality and reduced life expectancy. With the development of global industrialization and urbanization, the problem of PM2.5 in the atmospheric environment has become increasingly serious. However, the filter method, which is a conventional sampling method, cannot collect a sufficient amount of PM2.5 particles to carry out toxicity assays using cells. In addition, when PM2.5 particles collected by filter method were used in the cell exposure experiment, influence of contaminants derived from the filter material cannot be avoided. So we propose a new type of high-volume PM2.5 particle sampler using an impactor and a cyclone, which can also avoid the effect of filter material and the clogging of the filter. It has two parts to collect samples, cyclone and back-up filter. The 50% cut-points of the cyclone for ambient aerosols at 1,100 L/min of air flow was 0.3 μm. India, as an Asian country with rapid economic development, have a typical representation of air pollution. The annual mean concentrations of PM2.5 was found to be about 160 μg/m^{3}in 2013. In this study, samples have been collected by the cyclone and back-up filter to analyze the concentration of metal elements and oxidative potential of PM2.5 in India.