

Development of a Mini Step Sumpler for Air-Pollution Monitoring

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ABSTRACT

We developed a mini sampler with low manufacturing and running costs for air-pollution monitoring. The miniaturization of the sampler was realized by reducing a suction nozzle size. However, it may cause problems as non-uniformity, choke of filter and high detection limit. We tested the samplers with suction nozzle diameters of 2 and 4 mm. Elemental concentrations of aerosol collected by these samplers were consistent within $\pm 20\%$. The sample uniformity did not show meaningful changes among each other. Sampling with small suction nozzle did not affect aerosol collections. Then we developed mini step samplers of 2 mm-suction nozzle diameter and applied them to room aerosol monitoring. Aerosol samples were collected simultaneously at two positions of our laboratory and a hall out of our laboratory for 3 days and analyzed by PIXE. Time variation of elemental concentrations was high in the daytime and low at night and weekend. Elemental concentrations of the hall were always higher than those of the other places. In our laboratory, we change shoes at the entrance of the room. Therefore, elemental concentrations inside the lab are lower than that of the hall.