

## Characteristics of PM<sub>10</sub> and PM<sub>2.5</sub> in the Iksan in Korea during April, 2004

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### Abstract

Intensive measurements of PM<sub>10</sub> and PM<sub>2.5</sub> were conducted in the Iksan from April 16 to May 1, 2004. The sampling site is located in the downtown area of Iksan (35.9661° latitude, 129.9556° longitude), which is a small city located southwest of the Korea peninsula and more closely to China continent than other regions. The population of Iksan is about 0.34 million people in 507.03 km<sup>2</sup> area with 8.9 ten thousand motor vehicles. PM<sub>10</sub> and PM<sub>2.5</sub> samples were collected using a PM<sub>10</sub> and PM<sub>2.5</sub> sampler, respectively. A PM<sub>2.5</sub> sampler was composed of an URG cyclone inlet with a cut-size of 2.5 μm, a Teflon filter pack, a flow controller, and a vacuum pump. The same configuration of the sampler was used for PM<sub>10</sub> measurement with an URG cyclone with a cut-size of 10 μm. The airflow rate was maintained as 16.7 L min<sup>-1</sup> using an airflow controller. PM samples were collected twice a day during daytime (09:00-18:00) and nighttime (18:00-09:00). Filter preparation, handling, and extraction were made according to the procedures recommended by the United States Environmental Protection Agency. Sampled filters were extracted with 20 mL deionized water in an ultrasonic bath for 20 min. The aqueous extract was analysed for anions (SO<sub>4</sub><sup>2-</sup>, NO<sub>3</sub><sup>-</sup>, Cl<sup>-</sup>) and cations (NH<sub>4</sub><sup>+</sup>, Na<sup>+</sup>, K<sup>+</sup>, Ca<sup>2+</sup>, Mg<sup>2+</sup>) using ion chromatography (DX-100, Dionex). Average concentrations of PM<sub>10</sub> and PM<sub>2.5</sub> mass measured were 61.21 ± 35.31 μg/m<sup>3</sup> and 33.94 ± 15.73 μg/m<sup>3</sup>, respectively. The sum of ionic chemical species concentrations for PM<sub>10</sub> and PM<sub>2.5</sub> was 20.4 μg/m<sup>3</sup> and 14.8 μg/m<sup>3</sup>, respectively. SO<sub>4</sub><sup>2-</sup>, NH<sub>4</sub><sup>+</sup>, and K<sup>+</sup> dominantly existed in fine particulate mode, NO<sub>3</sub><sup>-</sup> and Cl<sup>-</sup> were in fine particulate mode and coarse particulate mode, but Na<sup>+</sup>, Ca<sup>2+</sup>, and Mg<sup>2+</sup> mostly existed in coarse particulate mode.