

THE TEMPORAL DISTRIBUTION CHARACTERISTICS OF ATMOSPHERIC MERCURY IN AN URBAN AREA OF SEOUL, KOREA

M.Y. Kim¹, Z.H. Shon², K.H. Kim³, Y.S. Yoo⁴

¹*Air Quality Department, Seoul Metropolitan Institute of Public Health And Environment, Seoul, Korea*

²*Department of Environmental Engineering, Dong-Eui University, Busan, Korea*

³*Department of Earth and Environmental Sciences, Sejong University, Seoul, Korea*

⁴*Department of Environmental System Engineering, Seoul Health College, Kyung-Gi Province, Korea*

In this work, the present concentration levels of gaseous elemental mercury (GEM) in Seoul, Korea are examined based on continuous measurements made over a long-term period of 1997 through 2002. The mean hourly concentration of Hg determined from this six-year period was computed to be 5.32±3.53 ng m⁻³ (N=27,170). The inspection of the diurnal distribution patterns indicated the presence of notably high concentration levels during nighttime relative to daytime (e.g., the mean hourly value as high as 9 ng m⁻³ in winter nighttime). When divided seasonally, the highest mean of 6.12 ng m⁻³ was also observed during winter followed by spring, fall, and summer. The results of our analysis confirmed the relative dominance of winter (seasonally) or nighttime (diurnally), while exhibiting a complicated trend on a long-term basis. Examination of our data over a different temporal scale consistently indicated that dynamic changes in Hg concentrations occurred through time in line with changes in the strength and diversity of the source processes. It is thus acknowledged that the presence of unusually high Hg levels is the consequence of intense man-made activities, while such signatures can vary in a competitive manner. Finally, the current status of Hg pollution in the atmosphere of three East Asian countries, China, Japan, and Korea, was assessed based on our measurements and literature review; the results indicated a highly complicated pattern in which the distribution of Hg is characterized by the presence of unusually high concentrations in concert with wide spatial variabilities.