

# PREDICTION OF ATMOSPHERIC CONCENTRATIONS AND EVALUATION OF THE *POLLUTANT RELEASE AND TRANSFER REGISTER (PRTR)* DATA IN JAPAN: A CASE STUDY OF BENZENE

A. Fushimi <sup>1</sup>, H. Kajihara <sup>2</sup>, K. Yoshida <sup>1,3</sup> and J. Nakanishi <sup>1,3</sup>

<sup>1</sup> *Yokohama National University, Yokohama, Japan*

<sup>2</sup> *Niigata University, Niigata, Japan*

<sup>3</sup> *National Institute of Advanced Industrial Science and Technology, Tsukuba, Japan*

According to the Pollutant Release and Transfer Register (PRTR) system, implemented in 2001, emission data of various chemicals (PRTR data) are available to the public in Japan. In order to evaluate the applicability of an atmospheric dispersion model called the Industrial Source Complex Long-Term Model (ISCLT3) for predicting wide-area concentrations of air pollutants based on the PRTR data, concentrations of nitrogen oxides (NO<sub>x</sub>) were predicted. The predicted NO<sub>x</sub> concentrations agreed well with the observed values in Kawasaki City and the Tokyo Metropolis. Using the emission data reported in the PRTR Pilot Project, benzene concentrations in Kawasaki City and the Tokyo Metropolis were predicted using the ISCLT3. The predicted benzene concentrations explained only 16% of the observed values on the average (Fig.1). Benzene emission was estimated using reported emission data other than the PRTR data. The estimated benzene emission amount in Kawasaki City increased by 6.7 times for automobiles, 1.5 times for factories, and 3.2 times for total. Using the estimated benzene emission data and considering background concentration, the predicted benzene concentrations agreed well with the observed values (Fig.2). These results indicate that the method based on the ISCLT3 is applicable for predicting wide-area concentrations of various air pollutants and evaluating the PRTR data. The methods and results are detailed in elsewhere<sup>1)</sup>. Furthermore, benzene emission data especially from automobiles were discussed in comparison with the first regular PRTR data and other reported emission data.

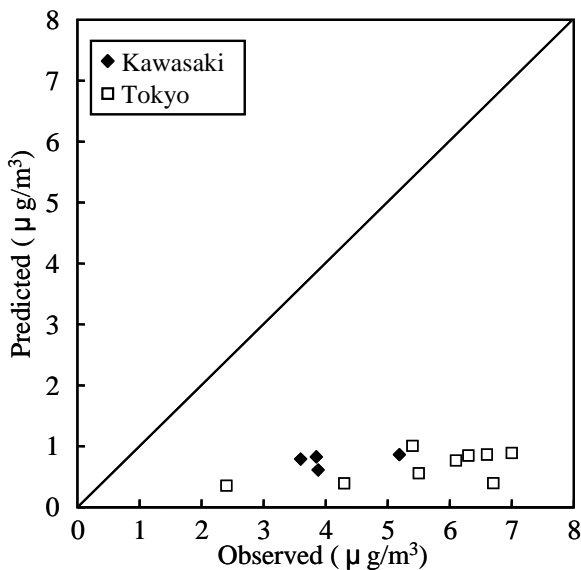


Fig.1 Predicted\* and observed benzene concentrations. (\*PRTR-based emission data was used.)

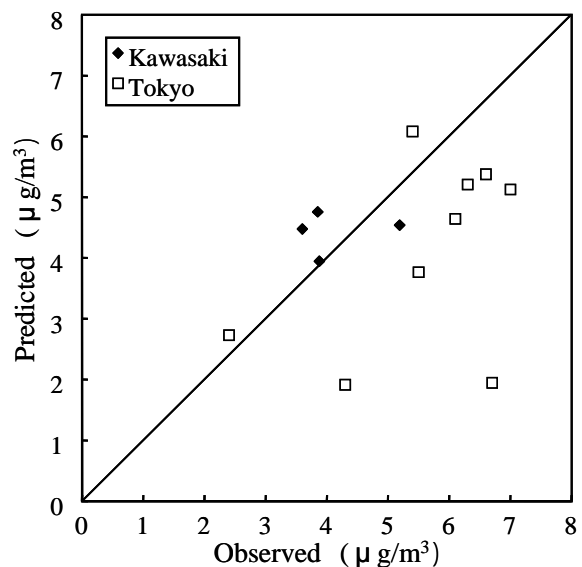


Fig.2 Predicted\* and observed benzene concentrations. (\*Emission data estimated in this study was used.)

1)Fushimi et al. (2002) *Environ. Sci., Japan*, **15**, 1, 35-47. [in Japanese]