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Correlation study of observation data of polycyclic aromatic hydrocarbons and chemical transport model calculation data of other pollutants at Wajima

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Abstract

Among the pollutants in the atmosphere, several polycyclic aromatic hydrocarbons (PAHs) and nitropolycyclic aromatic hydrocarbons (NPAHs) have carcinogenicity/mutagenicity or endocrine disrupting activity. PAHs and NPAHs are exhausted from the combustion of petroleum and coal. Coal consumption in China is the largest in the world and represents over 75% of the energy source in China. Long-range transport of atmospheric PAHs and NPAHs from China to Japan was investigated by collecting airborne particulates at Wajima in Noto peninsula from September 17, 2004 to September 16, 2005. As a result, the atmospheric concentration of PAHs showed a high level during the heating period of China. Furthermore, the composition of PAHs at Wajima, during the period, was close to that at Shenyang but not Kanazawa.

On the other hand, it is thought that the simulation model is also a helpful method to predict the long-range transport of atmospheric pollutants such as PAHs and NPAHs. A Community Multi-scale Air Quality model based on the Regional Atmospheric Modeling System for the Asian Domain had been developed and had been used to simulate the emission and transportation of several pollutants such as SO_x and NO_x. Considering the reaction mechanism of PAHs and NPAHs in the atmosphere is not clear enough. We studied the correlations of observation data of PAHs and chemical transport model calculation data of other pollutants at Wajima as the first step of making a new model. As a result, good correlations were found between PAHs and SO₂, PAHs and ANO₃.