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### Emission source of PAHs in PM<sub>2.5</sub> particle in ambient air of Sakai city, Osaka

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**Statement of the Problem:** PM<sub>2.5</sub> whose diameter is smaller than 2.5 μm can travel through airway and deposit into lung tissue. Moreover, PM<sub>2.5</sub> carries many harmful compounds including polycyclic aromatic hydrocarbons (PAHs), byproduct from incomplete combustion of organic materials. For better knowledge about PM<sub>2.5</sub>-bound PAHs (p-PAHs) in Sakai City, Osaka, we measured PAHs in gas phase and particle phase (PM<sub>2.5</sub>) and apportion the sources as well as assess the lifetime lung cancer risk (LLCR).

**Methodology & Theoretical Orientation:** Using the low volume air sampler (LVAS) with flow rate of 4 L min<sup>-1</sup>, particles and gas phase of PAHs were collected on glass fiber filter (GFF) and polyurethane foam (PUF), respectively. Samples were collected on the rooftop of 3-storey building in Osaka Prefecture University, Sakai City, Osaka, Japan. HPLC was used for analyzing 11 PAHs including phenanthrene, anthracene, fluoranthene, pyrene, benz(a)anthracene, chrysene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, dibenz(a,h)anthracene, indeno(1,2,3-cd)pyrene. Diagnostic Ratios (DR) method for apportioning the PAH's sources. Backward trajectory was used for tracing source location.

**Findings:** Main sources of PAHs were gasoline evaporation, vehicular emission and coal combustion. There was no significant correlation between PAHs and air pollutants (NO<sub>x</sub>, SO<sub>2</sub>, NMHC, etc.) at night time. The results showed that the gaseous PAHs were from local sources while the PM<sub>2.5</sub>-bound PAHs were from distant place. Backward trajectory results showed East Asia might be one of emission source's locations of PAHs in PM<sub>2.5</sub> in Sakai City, Japan. The mean TEQ and MEQ in particle phase values were higher than annually averaged standard of 1 ng/m<sup>3</sup> of EPA.

**Conclusion & Significance:** Based on the TEQ values, Sakai City air were considered to be harmful to human health. Because atmospheric pollution is a global issue, there is a need for international policy about PM<sub>2.5</sub> and harmful substances on it.

#### Biography

Oanh Pham is a Doctoral student who is interested in organic pollution in atmosphere. After obtaining Bachelor's degree in Environmental Technology, she joined Master's course of Applied Chemistry Department, Major Environmental Chemistry. She has experienced collecting TSP and PM<sub>2.5</sub>, analyzing BPA and PAHs along with using receptor models for acknowledging the pollution trends, sources and effects. She is interested in the effects of PAHs, besides using TEF method to assess the cancer risk. Currently, she has been investigating the reactions between PAHs and air pollutants in ice under effect of light.

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