

Program for Advancing Strategic International Networks to Accelerate the Circulation of Talented Researchers
Japan-ASEAN Collaboration Research Program on Innovative Humanosphere in Southeast Asia:
In search of Wisdom toward Compatibility Growth and Community in the World

Dispatch Report

Primary investigation of roadside VOCs in Hanoi

Year: Fiscal year of 2014

Place of fieldwork: Atmospheric Chemistry, Department of Natural Resources, Hall of Global Environmental Research / Graduate School of Global Environmental Studies

Field of Dynamics of Earth and Cosmos, Course of Dynamics of Natural Environment, Department of Interdisciplinary Environment, Graduate School of Human and Environmental Studies,

Kyoto University

(Prof. Yoshizumi Kajii)

Name: Ly Bich Thuy

- Research background

Volatile organic compounds (VOCs) are of major concern in air pollution because of the toxicology of some species and the participation of VOCs in several atmospheric reactions with the two most serious pollutant products, stratosphere ozone and secondary particulate matters. Hanoi is a developing city with busy transportation where the number of vehicles increased more than the increasing of road surface area. More than 90% of vehicles are motorbikes which are not equipped with good air pollution treatment system. The main fuel for transportation is gasoline with aromatic additives. Therefore, high levels of VOCs including toxic compounds are expected in near road of Hanoi. High level of VOCs will pose the risk to a large portion of population, especially children. However, there have been yet 3 published researches about VOCs in Hanoi were published in ISI system showing a high level of toxic compounds. However the provided data with limited number of analyzed VOCs species or limited number of samples making a limited understanding about VOCs level and the management solution for VOCs.

- Research purpose and aim

Determination of VOCs levels in near road in Hanoi in order to evaluate recent VOCs profiles in near road in Hanoi and to seek for the solution to control VOCs

- Results and achievements by fieldwork

The images of sampling, and analysis are shown in Figure 1-3. Fifty VOCs species of 40 samples in 9 sites at different time during the weekday and 1 time during weekend in Hanoi were analyzed. Those data are the newest and cover a wide range of VOCs show a comprehensive view of VOCs occurrence in near road in Hanoi (detailed will be reported in 1 reviewed paper). The extracted result data are shown in Figure 4-6.



Figure 1: Taking VOCs samples in near road in Hanoi



Figure 2: GC-FID in Kyoto University to analyze VOCs

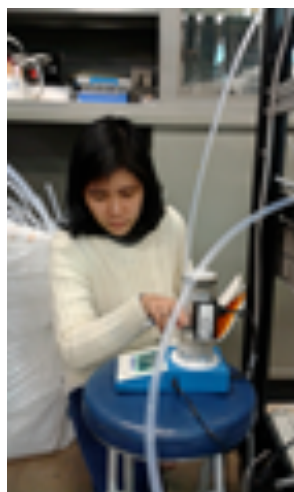


Figure 3: Flowrate calibration for VOCs standard preparation

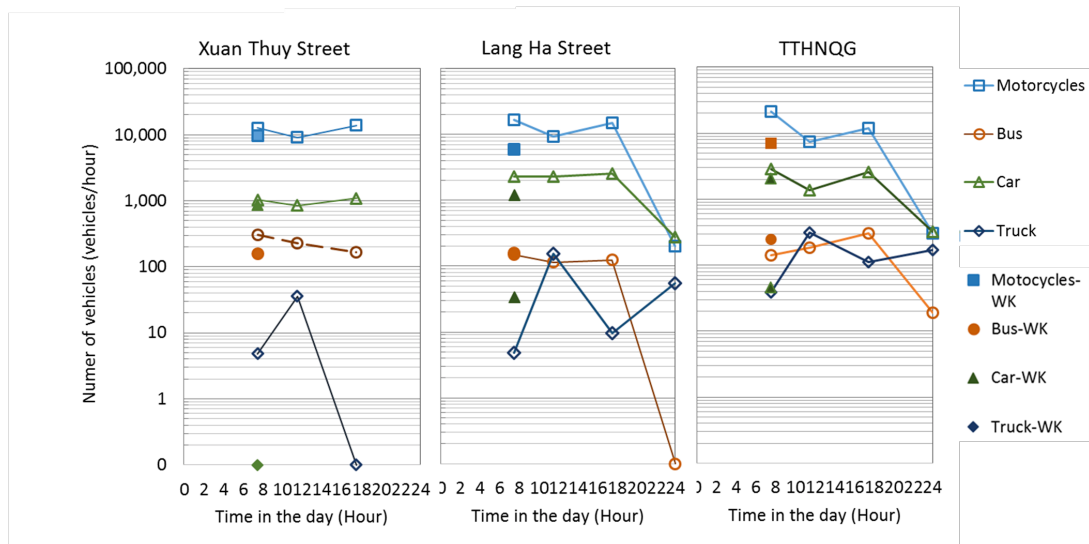


Figure 4: Extracted data of number of vehicles in examined streets

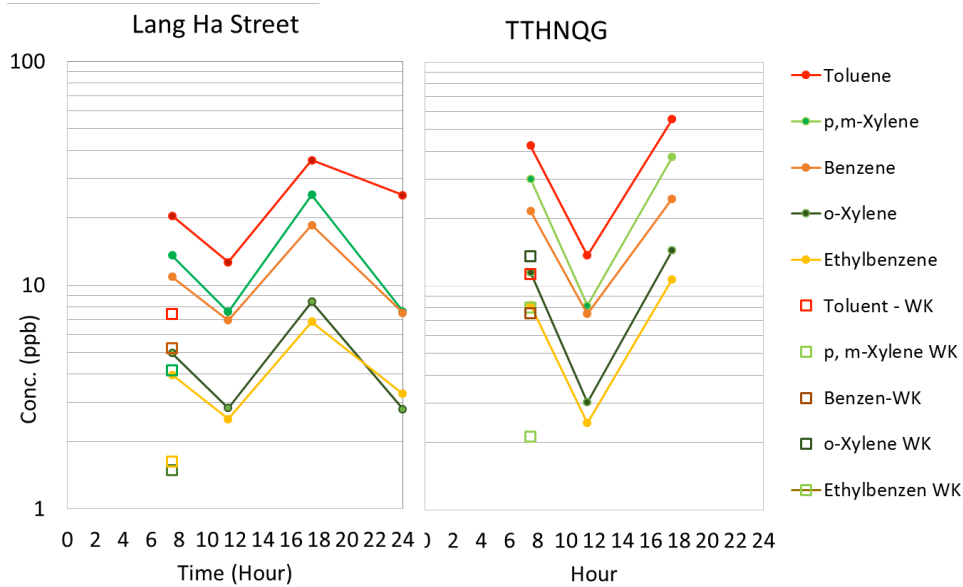


Figure 5: Extracted data of BTEX concentrations in examined streets

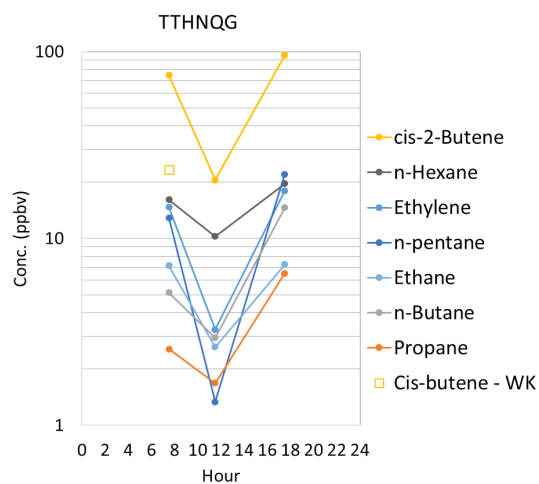


Figure 6: Extracted data of some dominant species other than BTEX in an examined street

- Implications and impacts on future research

This dispatch allowed to produce a snapshot but comprehensive view about VOCs level in Hanoi, primary allow to allocate sources of VOCs and its potential impact. A future research to determine time depended VOCs level and different sources emission factors of VOCs will help to set up a recommended management solution.

A new collaboration was also established between dispatch researcher and host professor.