**EFFECT-DIRECTED ANALYSIS OF POLYCYCLIC AROMATIC HYDROCARBONS (PAHS)…….**

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**Abstract**

Significant higher aryl hydrocarbon receptor (AhR) agonists were found in road dust in urban than in the rural site, with median values of 8 and 2 ng CALUX-TEQ/g, respectively. The highest induction level was detected with Hanoi samples; up to approximately 11 ng CALUX-TEQ/g dry weight. The contributions of PAHs were obtained in the range of 10 to 38% of CALUX-TEQ for Hanoi road dust and 4 to 11% of CALUX-TEQ for Duong Quang. ……

***Key words:***

**1. INTRODUCTION**

Industrialization, urbanization and high economic growth of recent years has been accompanied by degradation of environmental quality, especially the atmospheric environment, in Hanoi, Being located in the Red River delta. Hanoi, Vietnam’s capital is one of the big cities in Asia with over 3.4 million inhabitants in urban districts. Hanoi urban area consists of 7 urban districts that cover 918.5 km2 in a total of 3,344 km2 of the Hanoi metropolitan area. The air pollution in Hanoi is at alarming level. The dust density on Hanoi streets and roads is in the range of 20-40 g/m2/year, especially with higher values on the ring roads with the high figures up to 100-400 g/m2/year are reported whereas 10 g/m2/year is the normal average in developed …

**2. MATERIAL AND METHODS**

**2.1. Sample collection**

Road dust samples were collected from two locations Hanoi (*n*=9) and Duong Quang village in Vietnam (*n*=4) during 2011. These road dust samples were kept in ice immediately after collection, shipped to es-BANK in CMES-Japan with dry ice and preserved there at -25 °C until analysis.

**2.2. Sample extraction and pre-treatment**

Road dust samples were dried in oven at 25°C, and then sieved using stainless sieve with a diameter of 500 µm to remove impurities and particles over 500 µm in size. Two grams of < 500µm sample were extracted with acetone/hexane and toluene using a rapid solvent extractor (SE100, Mitsubishi Chemical Analytech), respectively. A portion of the extract 0.2g was t…

**3. RESULT AND DISCUSSION**

**3.1. Dioxin-like activities in Road dust**

The dioxin-like activities were detected by DR-CALUX in all the road dust samples. Significant higher CALUX-TEQs in road dust were found in Hanoi than in rural site, Duong Quang (Fig. 1). Highest induction level was detected with Hanoi samples; up to approximately 11 ng/g dry weight. The median value of the CALUX activity of the road dust extract was in the range of 2 and 8 ng CALUX-TEQ/g for rural and urban road dust, respectively. The CALUX-TEQs found in dust particles with a diameter less than 500 µm could be comparable to those in settled house dust collected in Vietnam9) (median: 12 ng/g, Fig.1)…



**Fig 1.** Comparison of CALUX-TEQ in dust samples from various locations

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**Table 1.** Comparison of MeHg recovery in 3 matrices using different isolation techniques

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| --- | --- |
| **Samples** | **Recovery (%)** |
| **KBr/H2SO4/CuSO4 leaching** | **KCl/HNO3/CuSO4 leaching** |
| Double distilled water | 100 ± 12 | 95.0 ± 1.6 |
| Low TOC (4.7 %) | 102.3 ± 4.7 | 89.03 ± 0.72 |
| High TOC (0.54 %) | 66.2 ± 8.9 | 91.09 ± 0.30 |

**4. CONCLUSIONS**

To our knowledge, this is the first report on the determination and toxicant contribution assessment of PAHs in road dust from Hanoi, one of a sub-tropical metropolitan in Asian area. The obtained result, therefore, provide valuable information for the public and environmental authorities of Vietnam to have plan in mitigation of the discharge of toxic chemicals from traffic exhaust to Hanoi ambient air.

**References**

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