

A-2-1 E-waste, Recycle, Thai & Vietnam

by Kannan & Watanabe

A-2-1-1

Shin TAKAHASHI et al.: Dioxin-Related Compounds and Brominated Flame Retardants released by E-waste Recycling Activities: Comparison between Case Studies in Vietnam and Ghana

Presentation was cancelled.

E-waste is great concern because of environment impacts and adverse effects on human health

A-2-1-1

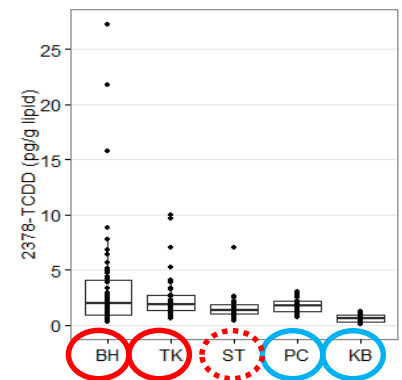
Pornnapa SUTAWONG et al.: Public Participation in Health and Environment Protection System of E-waste Recycling Community in Khok Sa-At sub-district, Thailand.

E-waste is a global environmental and health issue. Public participation in health and environmental protection system in e-waste management is interesting and important.

A-2-1-3

Ho Dung MANH et al.: Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans Levels in Breast Milk of Primipara living around Dioxin Hotspots in Viet Nam.

Mothers living near hotspots, especially Bien Hoa (BH) and Thanh Khe (TK), still have higher TCDD levels than mothers living far from hotspots.



TeCDD distribution

B1-1 climate change, air pollution

By Toriba

B1-1-1 Microbial Community Survey in Water and Sediment of Ping Watershed along Three Seasons

Juthatip YOOYEN et al.

Bacterial community analysis in water of Ping watershed along 3 seasons were performed based V3 region of 16SrRNA using SSCP/DGGE techniques and DNA sequencing. The result indicated that many bacterial communities were found in water samples. *Pseudomonas* sp., *Flavobacterium* sp. and *Rhodofere* sp. were found in all seasons and *Pseudomonas* sp. was most abundant bacteria. The least diverse bacterial community was found in rainy season.

B1-1-2 Comparison between Individual Fe-Containing Particles in the Ambient Air and in Cloud Water Collected in the free Troposphere

Hiroko OGATA et al.

The Fe-containing particles transported over Japan in the free troposphere at the summit of Mt. Fuji were observed. There were 2 peaks at 2-3 and 6-7 μm in the size distribution of continental particles. The particles with high Fe ratio (>75%) in mineral component (Al, Si, Fe) was finer than other minerals (mean: 1.64 μm). Air plume from the Sakurajima volcano acidified cloud water and Fe in the cloud water increased. The results showed the importance of cloud process for the variations of Fe solubility in aerosols.

B1-1 climate change, air pollution

By Toriba

B1-1-3 Exposure Assessment of Taxi Drivers to Environmental Nanoparticles in Shenyang, China

Akira TORIBA et al.

Environmental nanoparticles (<100 nm) were collected inside taxis in Shenyang, China by a prototype portable nanoparticle sampler to investigate exposure of the taxi drivers to polycyclic aromatic hydrocarbons (PAHs and NPAHs) through the nanoparticles in the road environment. The concentrations of PAHs and NPAHs around the taxis were higher than those collected at a roadside. Among the PM fractions, the high PAH and NPAH levels were observed in the PM_{0.1-0.45} and PM_{0.1} fractions, indicating that fine particles less than 0.5 μm (PM_{0.5}) greatly contribute to PM_{2.5} from automobile exhaust.

B1-1-4 Automobiles, Railways and Aircrafts as Emission Sources of Harmful Elements

Hirokazu OZAKI et al.

The emission sources and pollution state of heavy metals from transportation sector, automobiles, railways and airplane were elucidated in this study. Heavy metals were analyzed in street dust and rail-side dust on pavement, and roof dust of terminal building in airport. Automobiles were one of primary heavy metal sources in living conditions. Railways and airplanes were observed to be significant sources. They are “forgotten” but notable origin because of the higher contamination level.

B2-1 “Biomass & Toxicity” session report

by Fujikawa

Three studies were presented.

- 1) A study on the invention of a novel reactor to produce bio-charcoal was presented. The reactor could be operated in a way smoke and VOC other than benzene were not generated.
- 2) A study on biological filtration system to remove arsenic, especially arsenite, from iron-rich groundwater was presented. The mechanisms of removal was discussed using the data obtained by arsenic speciation analysis.
- 3) Exposure of Thai people to some agrochemicals were surveyed by a simple calorimetric method. The potential cause and pathway of the exposure were evaluated based on the obtained results.

B2-2: PCB, POPs

by Hirai

- B2-2-1: Unintentional PCB contamination in Chlorophenylsilane Compounds
 - K. Anezaki, T. Nakano
- B2-2-2: Emission Sources of PCBs in Japan
 - Y. Hirai, S. Hashiot, S. Sakai
- B2-2-3: POPs Monitoring Techniques in Ambient Air and Results from Frequent Monitoring at Super site, Japan
 - T. Takasuga, T. Nakano, Y. Shibata

B2-2-1: Unintentional PCB contamination in Chlorophenylsilane Compounds

- PCBs were found at > 50 mg/kg in some silane compounds.
- Levels and congener profiles are reported:
 - Dichlorodiphenylsilane (DCDPS) 6.5-1500 mg/kg
 - Monochlorobiphenyls dominated
 - Dichlorobiphenyls Only PCB-4, 6, 8, 11, 13, 15 detected
 - Diphenylsilanediol (DPSDO) 0.12-120 mg/kg
 - Profiles similar to DCDPS
 - Trichlorophenylsilane (TCPS) 0.00072 – 2.7 mg/kg
 - Chlorotriphenylsilane (CTPS) 0.019-1.1 mg/kg
- Adhesives were also measured for PCB levels.

B2-2-2: Emission Sources of PCBs in Japan

- PCB emission inventory
 - MonoCBs: Cement production >> PCB waste
 - Other PCBs: Emission from PCB waste >> Cement
- Panel data analysis of monitoring data
 - Statistically significant decreasing trend was found except for MonoCBs and DiCBs
 - Difference among homologues may reflect different emission sources

B2-2-3: POPs Monitoring Techniques in Ambient Air and Results from Frequent Monitoring at Super site, Japan

- Frequent sampling at Cape Hedo in Okinawa
- 3 days/month x 12 month = 36 samples
- POPs levels from 2009 and 2012 were similar
 - HCBz, PeCBz, PCBs > HCHs > Endosulfans
Chrlodanes, PFOS, PFOA DDTs, HBCDs >
Heptachlors, Dieldrin, BDE 47
- No declining trend from 2009 to 2012
- Generally higher level in warm season

C1-1-1 Instrumental Analysis

by Hashimoto

In this session, next five titles were reported. All they were proposals about **instrumental solution** for environmental pollutants. **Precise separation** seems to have been common key word of their technologies although the usage was considered and optimized to each objective. For example, Takakuwa et al. achieved separation of PCB isomers by GC heart cutting, Nakagawa et al. and Kanan et al. isolated pollutants such as PAHs from matrix of sample by using MS/MS and GCxGC, respectively. Kadokami et al. and Hashimoto et al. presented their comprehensive works on target and non-target analysis by different way. In future trends, target analysis may be directing to more precise, and non-target analysis must be popular for environmental screening. And new technologies such as GCxGC and ultra-resolution MS are expected to open a new field of environmental studies.

C1-1-1 Instrumental Analysis

SEPARATION OF PCB ISOMERS #52 AND #69 IN KANECHLOR AND FISH OIL SAMPLES USING GC/MS/ECD

by Hiroshi TAKAKUWA *et al.*

SELECTIVE AND COMPREHENSIVE ANALYSIS OF ORGANOHALOGEN COMPOUNDS BY GC × GC-HRTOFMS AND MS/MS

by Shunji HASHIMOTO *et al.*

COMPREHENSIVE GC × GC - MS ANALYSIS OF WASTE MOTOR OIL FROM MALAYSIA REVEALS *IN-SITU* PRODUCTION OF PAHs: A NEW POLLUTION SOURCE

by Narayanan KANNAN *et al.*

Advantages of GC/MS/MS Analysis for PCBs, PBDEs and PAHs

by Katsuhiko NAKAGAWA *et al.*

SCREENING ANALYSIS OF 1200 MICRO-POLLUTANTS IN RIVER WATER IN VIETNAM

by Kiwao KADOKAMI *et al.*

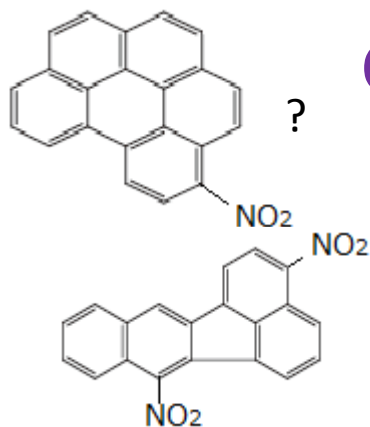
C1-2 (PPCPs, N-PAH, Phthalates)

by Yamamoto



C1-2-1

Estimated Contribution of PPCPs (pharmaceuticals and personal care products) is very limited (up to 2%) for daphnia and fish toxicity of urban stream water while it is up to 40% for green algae, especially for antimicrobials such as triclosan/clarithromycin.



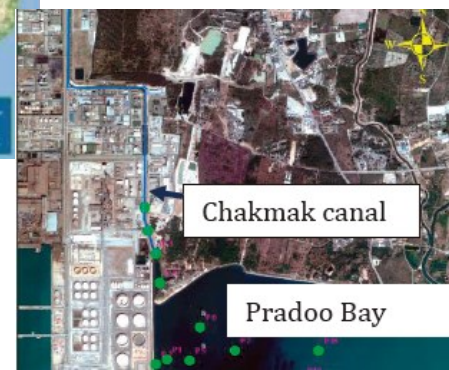
C1-2-2

As results of laboratory combustion experiments and computational analysis, some novel nitro-PAHs were identified such as mono-NO₂-dibenzo[a,i]pyrene and dinitro-BkF isomers, which was found to be potentially strong direct-acting mutagens.



C1-2-3

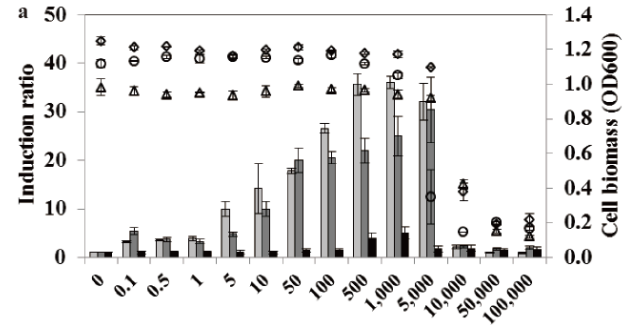
Plasticizers, dibutyl phthalate (DBP) and diethylhexyl phthalate (DEHP), were monitored near the largest petrochemical industrial estate in Thailand, and the maximum concentrations were 339 $\mu\text{g}/\text{L}$ in water and 2.85 $\mu\text{g}/\text{g}$ dry weight in sediment, which suggest both were far above the environmental risk limit (ERL).



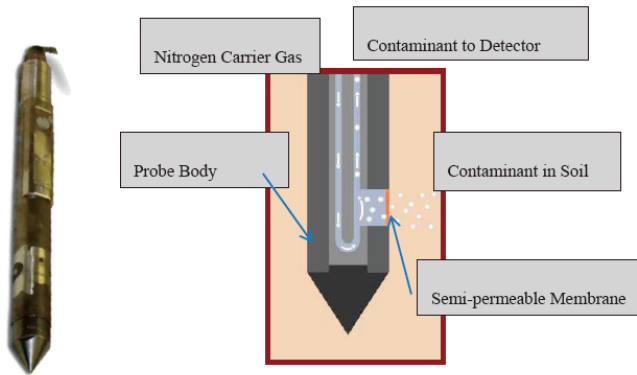
C1-3 analysis, bioassay by Nakajima

C1-3-1: Naruemon CHUMJAI et al., DEVELOPMENT OF THE TWO-VECTOR, GREEN FLUORESCENCE PROTEINBASED BIOREPORTER FOR BTEX DETECTION

The recombinant bacteria, was initially constructed as a bioreporter and then used to monitor the presence and toxicity of BTEX as well as other aromatic compounds.



Dose response of the bacteria to BTEX



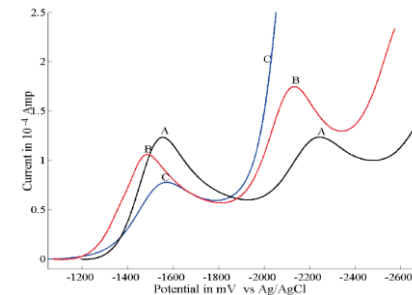
MIP principle

C1-3-2: Tanapon PHENRAT et al., Membrane Interface Probe (MIP) for Screening of Phenol Contamination from Illegal Dumping Sites at Nong Nea Subdistrict, Panomsarakarm District, Chachoengsao

The first study in Thailand to conduct field investigation of the four sources using MIP and also the first study to conduct field-scaled phenol screening using MIP.

C1-3-3: M.V.Sangaranarayanan, ELECTROCHEMICAL REDUCTION OF CARBON-HALOGEN BONDS USING VOLTAMMETRIC TECHNIQUES

The basic study of the mechanism elucidation that is necessary for the reductive resolution of halogenated compounds



Linear sweep voltammograms of reductive cleavage of CCl₄ (A) DMF; (B) imethyl acetamide and (C) Furan

C2-1 PFC treatment by Hori

Perfluoroalkyl surfactants such as perfluoroalkane sulfonates, perfluorocarboxylic acids, and their derivatives have been used in surface treatment agents, emulsifying agents in polymer synthesis, fire-fighting foams, and so on because of their high surface-active effect, high thermal and chemical stability, and high light transparency. After it became clear that some of them, particularly, perfluorooctane sulfonate (PFOS) and perfluorooctanoic acid (PFOA) persist and bioaccumulate in the environment, international legal measures regarding the production, use, and import and export of these chemicals (especially PFOS and related chemicals) were implemented, and efforts to develop greener alternatives are advancing. The perfluorinated chemicals consist of strong carbon-fluorine bonds so that they are little decomposed by conventional treatment techniques such as advanced oxidation processes and biological processes. Therefore, development of new decomposition techniques that work under mild conditions is desired for these chemicals.

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The first lecture of this session (C2-1-1; Hashiguchi et al.) reported on the decomposition of PFOS and/or PFOA induced by electrolysis or gamma-ray irradiation.

The second lecture (C2-1-3; Hori et al.) reported on the decomposition of a new perfluorinated surfactant, perfluoroalkane disulfonate, which has been being introduced in electronics industry as a PFOS alternative, in subcritical and supercritical water in the presence of zerovalent iron or FeO.

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The second lecture (C2-1-2; Watanabe et al. canceled) reports on the thermal decomposition behavior of PFOA, PFOS, and their analogues under argon or air atmosphere.

The third lecture (C2-1-3; Hori et al.) reports on the decomposition of a new perfluorinated surfactant, perfluoroalkane disulfonate, which has been being introduced in electronics industry as a PFOS alternative, in subcritical and supercritical water in the presence of zerovalent iron or FeO.

C2-2 Water treatment

(Koji Arizono & Wilai Chiemchaisri)

C2-2-1

MODIFICATION OF KAOLIN MINERALS FOR ADDRESSING ENVIRONMENTAL POLLUTION PROBLEMS

Niramon WORASITH

This presentation presented recent work on the generation, characterization, and properties of modified kaolins, illustrated by materials derived from two of the main kaolin deposits in Thailand, that have potential uses in addressing modern environmental pollution problems.

C2-2 Water treatment

(Koji Arizono & Wilai Chiemchaisri)

C2-2-2

BIODEGRADATION OF WASTE PLASTICS IN SOLID WASTE DISPOSAL
OPEN DUMP SITE

Sutharat MUENMEE1

Although many studies of biodegradation of plastics in the natural soil had been carried out and a number of microorganisms are isolated as pure culture, less attention has been paid to HDPE, LDPE, PP and PS biodegradation in practical condition where methane is produced and oxygen can transfer to waste body such as a dumping site. This study was to investigate potentiality of biodegradation of waste plastics via methane oxidation in the simulate lysimeter of open dump site of solid wastes. Information is helpful for solid waste management.

C2-2-3

BIODEGRADATION OF PHENOL AND PHTHALATE COMPOUNDS IN
LANDFILL LEACHATE BY MICROBIAL SLUDGE OF TWO-STAGE MEMBRANE
BIOREACTOR

Jarungwit BOONNORAT

This study tried to investigate long-term removal of phenol and phthalate compounds in MBR system and their biodegradation kinetics. As the results, the study indicated that the degradation of phenol and phthalate by phenol hydroxylase and phthalate dioxygenase, oxygen is the main importance factor of enzyme reaction.

C 2-3, PFC waste water, VOC, Landfill

(2 oral presentations from Thailand)

by Horii

The association between industries and the fate of PFOS and PFOA in central wastewater treatment plants (Boontanon at Mahidol Uni)

- Concentrations and mass loading of PFOS and PFOA in five different types of industrial wastewater from Thailand were determined.
- PFOS discharge into the water environ: 0.53-20 g/day

Volatile organic compounds emission from municipal solid waste landfill (Laowagul at ERTC)

- Emission rates of VOCs from Hua Hin sanitary landfill located at Thap Tai district, Thailand were estimated.
- The dominant VOCs were similar to those from other countries.

E 1-1 Risk communication

by Sekizawa & Yoshida

E-1-1-1

In Tohoku region, to reduce the anxiety or the stress especially from the radiation exposure, risk communications about radiation exposure to human body were held vigorously and rigorously based on this research.

E-1-1-2

From these results, prompt emergency response using index in emergency, appropriate monitoring, information sharing are important to control risk related to accidents already occurred.

E-1-1-3

Historical development of practical risk communications in the environmental protection and food safety in Japan was reviewed, and some lessons learned from recent practice and future tasks regarding food contamination by radionuclides and potential health effects were shown.

JICA-1

Pollutant Release and Transfer Register – PRTR

by Szuki

- The session discussed mainly the Pilot PRTR System in Thailand.
- 2 presentations covered overview of PRTR program in OECD countries and Japan (Mr. Kaneko of MoE Japan) and the pilot PRTR program in Thailand (Ms. Teeraporn of PCD, Thailand).
- 3 presentations introduced progress of pilot PRTR program mainly focusing release estimation for point source (Jariya of IEAT, Thailand), non-point mobile sources (Ittipol of PCD, Thailand), and small industries (Sirakarn of DIW, Thailand), respectively.
- 2 presentations showed efforts on PRTR by industry by two companies (Worachai of SCG Chemicals and Somchit of PTT Global Chemical Public Co.).
- The session well summarized the progress of PRTR program in Thailand. Information shared will be a good basis of next step progress of PRTR in Thailand and also of every other country working on current and future PRTR program.

E 1-2&3 JICA 2

Strengthening Research on Micro-pollutants in Asia by Kadokami

- Speakers from three countries gave presentations about their research activities, research topics and/or efficient monitoring methods of micro-pollutants.
- In the panel discussion, the following opinions for strengthening research activities were shown.
 - Capacity building especially of young researchers is the most important.
 - Not only transferring our experiments and knowledge, but also giving them a motivation are useful for rearing independent researchers.
 - Learning English when young is very useful to get knowledge and to exchange among researchers.
 - Self learning using our own money and time is essential.
 - Cooperating with other researchers and exchange knowledge among researchers are also useful.

Outline of JAIMA

- Japan Analytical Instruments Manufacturers' Association (JAIMA) consists of analytical instruments related companies.
- JAIMA was founded with 18 member in 1960, and around 200 companies join the association at present.

Environment related activities of JAIMA

- We have some activities for “Environmental Conservation”.
 - Seminars for environmental regulations
 - We contribute to establish JIS as draft preparing organization. (General rules and technical terms for instrumental analysis)
 - We dispatch our representatives to other cooperative organizations to join the discussion for proposal or revise the JIS and ISO/IEC standards.
 - One of our member are attending INC (Intergovernmental Negotiating Committee) as a specialist of Mercury analysis.

JASIS

- One of most important activity for JAIMA is to held “JASIS”.
- JASIS is **one of the Largest Exhibitions in Asia** for Analytical and Scientific Instruments. JAIMA held JASIS **every year** with Japan Scientific Instruments Association.

