Abstract Book

SETAC North America 28th Annual Meeting

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This book is comprised of the abstracts of the presentations for the platform, interactive platform, and poster sessions of the 28th Annual Meeting in North America of the Society of Environmental Toxicology and Chemistry (SETAC), held at the Midwest Airlines Center, Milwaukee, Wisconsin, 11–15 November 2007. The abstracts are reproduced as accepted by the Scientific Program Committee and appear in numerical order. In each abstract, the Presenting Author's name is underlined.

This book contains an Author Index that cross-references the corresponding abstract numbers. A Session Index to all the presentations is also included.

422 **Quantifying Pollutant Emission Factors for Electronic Office Equipment: Results of Chamber Studies.** T.E. McKone, R.L. Maddalena, H. Destaillats, M.L. Russell, A.T. Hodgson, Indoor Environment Department, Lawrence Berkeley National Laboratory, Berkeley, CA; H. Destaillats, Arizona State University, Tempe, AZ; T.E. McKone, School of Public Health, University of California, Berkeley, CA. The last few decades have seen major changes in how people collect and process information at work and in their homes. More people are spending significant amounts of time in close proximity to computers, video display units, printers, fax machines and photocopiers. At the same time, efforts to improve energy efficiency in buildings by reducing leaks in building envelopes are resulting in tighter (less ventilated) indoor environments. Therefore, it is critical to understand pollutant emission rates for office equipment because even low emissions in areas that are under-ventilated or where individuals are in close proximity to the pollutant source can result in important indoor exposures. We present here the results of a project in which we measured emission factors for a range of chemical classes including volatile and semivolatile organic compounds (VOCs and SVOCs), ozone and particulates. The measured SVOCs include phthalate esters, brominated and organophosphate flame retardants and polycyclic aromatic hydrocarbons. We made these measurements in large and small exposure chambers for several different categories of office equipment. We started by operating a number of units simultaneously for each equipment category using specific duty cycles in a large test chamber and measured emissions for a range of pollutant. Results from the screening experiments identified pollutants and conditions that were relevant for each category of office equipment. In the second phase of the study, we used a smaller test chamber to measure pollutant specific emission factors for individual devices and explored the influence of a range of environmental and operational factors on emission rates. The measured emission factors provide a data set for estimating indoor pollutant concentrations and for exploring the importance of user proximity when estimating exposure concentrations.

424 **An Exposure Assessment of Methylmercury from Seafood for Consumers in Japan.** Y. Zhang, S. Masunaga, Yokohama National University, Yokohama, Japan. Seafood consumption is promoted due to its positive effects on health. But on the other hand, bio-accumulated chemical contaminants in seafood are consumed simultaneously, such as methyl mercury, PCB. Due to this dilemma, an exposure assessment of nutrients and contaminants via seafood is important to do to provide more detailed information. In addition, the average seafood consumption in Japan is about ten times than that in USA. Therefore it is necessary to know the statue of contaminants intake in current Japanese. An exposure assessment via seafood is conducted in this paper, considering methyl mercury as contaminant. Mercury exposure via seafood are quantified by determining the distribution of concentrations in seafood and fish consumption distribution for consumers. Deterministic and probabilistic exposure assessments are both conducted, especially for both women with child-bearing age and children (1-to-6-year old), who vulnerable to the exposure to methyl mercury. Three biomarkers simulations are conducted to predict population distribution for mercury in blood and hair. The estimated results are then compared with subtotal survey data of Japanese, which illustrated taht estimated hair mercury level is similar to survey data. In conclusion, the simulation method used in this paper is suitable for exposure assessment via seafood consumption.

425 **Assessment of Human Exposure to Polybrominated Diphenyl Ethers in China via Fish Consumption and Inhalation.** E.Y. Zeng, X. Meng, L. Yu, Y. Guo, State Key Laboratory of Organic Geochemistry, Guangzhou Institute of Geochemistry, Guangzhou, China; X. Meng, L. Yu, Y. Guo, Graduate School, Chinese Academy of Sciences, Beijing, China. This study examined human exposure to polybrominated diphenyl ethers (PBDEs) associated with fish consumption and inhalation in China. The median intake of S7 PBDEs via human milk was 48.2 ng/day for nursing infants (0-1 years old) (a range of 23.4-99.1 ng/day). For all other age groups, the median intake of S11 PBDEs via fish consumption was 1.7-12.9 ng/day with a range of 0.59-56.3 ng/g. Additionally, human exposure to PBDEs via inhalation was 2.7-9.2 ng/day (a range of 0.72-108 ng/day). The median total S10 PBDEs intakes for nursing infants (6,874 and 7,372 pg/kg b.w./day for males and females, respectively) were much higher than other age groups (215-608 pg/kg b.w./day). No significant difference in the total PBDEs intakes was found between males and females. Of the 11 PBDEs congeners, BDE-47 was predominant in the total intake for nursing infants with a mean contribution of 38%, whereas BDE-209 was the dominant congener of total intake for other age groups, varying from 44% to 61%. Currently, the PBDEs levels in Chinese consumer fish and the total intakes of PBDEs via fish consumption were at the lower end of the global range. Compared with similar studies in other countries, however, human exposure to PBDEs via inhalation in China was relatively high. Overall, estimated daily intake of total PBDEs in Chinese population was far below the lowest observed adverse effect level. However, studies are needed to further understand the fate and impact of PBDEs as PBDE-containing products are still used widely and in large quantity in China. Keywords: Human exposure; Polybrominated diphenyl ethers; Fish consumption; Inhalation; China

426 **Assessing the risk in infants: PBDE, PCB, and organochlorines pesticide levels in human breast milk from Massachusetts, USA.** B. Johnson-restrepo, K. Kannan, Environmental Health Science, School of Public Health - State University of New York at Albany, Albany, NY; R. Addink, K. Kannan, Wadsworth Center, New York State Department of Health, Albany, NY; C. Wong, K. Arcaro, Department of Veterinary & Animal Sciences, University of Massachusetts-Amherst, Amherst, MA; B. Johnson-restrepo, Environmental and Computational Chemistry Group - Department of Chemistry, Universidad of Cartagena, Cartagena, Bolivar, Colombia. Concentrations of polybrominated diphenyl ethers (PBDEs), polychlorinated biphenyls (PCBs), and organochlorine pesticides (OCPs) were measured in human breast milk samples collected across Massachusetts, USA in 2004. Seventeen PBDE congeners were found in the samples, ranging in concentration from 0.06 to 1910 ng/g lipid wt. BDE-47 (2,2',4,4'-tetraBDE), BDE-99 (2,2',4,4',5-pentaBDE), and BDE-100 (2,2',4,4',5-pentaBDE) were the major congeners detected in breast milk samples. Overall mean concentrations(mean ± SD) of PCBs, DDTs, HCHs, CHLs, and HCB were 305 ± 262, 64.5 ± 75, 18.9 ± 19, 32.4 ± 36, and 2.3 ± 2.2 ng/g lipid wt, respectively. Concentrations of PBDEs were strongly correlated with concentrations of PCBs and OCPs in the samples. Based on the concentrations of organohalogens and the intake rates of breast milk by infants in the United States, daily ingestion rates of contaminants were calculated. The median ingestion rates for PBDEs, PCBs, DDTs, HCHs, CHLs, and HCB were 5.7, 60.7, 18, 3.1, 3.5, and 0.5 μg/kg body wt/day, respectively. The estimated daily intake of organohalogens by infants was compared with the minimum risk level (MRL) suggested by the Agency for Toxic Substances and Disease Registry (ATSDR), for calculation of hazard quotients (HQs). HQs for individual organohalogens and the sum of HQ for all organohalogens were calculated as HQ indices (SHQi). The results suggest that the HQ values for PCBs and DDTs exceeded one, for 76% and 42% for the breast milk samples, respectively; thus, these two legacy contaminants continue to be a concern.

427 **Biomonitoring of Perfluorinated Compounds in Human Breast Milk from Massachusetts, USA.** L. Tao, K. Kannan, Department of Environmental Health Sciences, State University of New York at Albany, Albany, NY; L. Tao, K. Kannan, New York State Department of Health, Wadsworth Center, Albany, NY; C. Wong, K. Arcaro, Department of Veterinary & Animal Sciences, University of Massachusetts-Amherst, Amherst, MA. Perfluorinated compounds (PFCs), especially perfluorooctanesulfonate (PFOS) and perfluorooctanoic acid (PFOA) are contaminants of concern due to their prevalence in the environment, bioaccumulation in humans and wildlife, and toxicity. Although PFCs have been detected in human blood from several countries, occurrence in human breast milk and potential for exposure of infants to PFCs through breastfeeding were not studied in detail, so far. In this study, 11 PFCs were measured in 45 human milk samples collected from Massachusetts, USA, in 2006. A method to measure trace levels of PFCs in breast milk was developed and validated; 5 to 10 mL of breast milk was used to enable low levels of detection. PFOS and PFOA were the two predominant PFCs found at mean concentrations of 121 pg/mL and 40 pg/mL (wet wt), respectively. Perfluorohexanesulfonate (PFHS) and perfluorononanoic acid (PFNA) were detected in 45% and 60%, respectively, of the samples analyzed at concentrations lower than that of PFOA. PFOS concentrations determined in our study were similar to or lower than those previous reported from other countries. The concentration pattern of PFCs in breast milk was similar to the pattern found in blood. Significant correlation between concentrations of PFOS and PFOA was found. Correlation between PFC concentrations in mother's milk and the age of infants was examined. Daily intake of PFCs by infants through the ingestion of breast milk was calculated.