19th International Mass Spectrometry Conference

PROGRAMME

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Kyoto International Conference Center

Saturday 15th September – Friday 21st September 2012

Thursday, 20th September

PTh-162 Analysis of perfluorinated compounds in sediment samples from wastewater canal of Pancevo industrial area, Serbia

13:30 – 14:40

Vladimir P Beskoski[1], Shuusuke Takemine[2], Takeshi Nakano[3], Latinka Slavkovic-Beskoski[4], Gordana Gojgic-Cvijovic[1], Mila Ilic[1], Srdjan Miletic[1], Miroslav M Vrvic[1,5]

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PTh-163 Study of On-site sampling method for Dioxin in water with high concentrations of suspended solids.

11:10 – 12:20

Takeshi Enomoto[1], Miho Okimoto[1], Chuanpit Boonyoy[2], Areerat Jaksakul[2], Ruchaya Boonyatumanond[2], Genta Takahashi[5], Kenji Tawara[5], Tohru Matsumura[3], Takeshi Nakano[4]

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PTh-164 Multi-residue analysis of pesticides in animal and fishery products, and their processed foods by dual-column GC-MS/MS

13:30 – 14:40

Eiji Ueno, Haruka Ohno, Minae Watanabe, Harumi Oshima, Eiichi Mikami

Aichi Prefectural Institute of Public Health, Nagoya, Japan

PTh-165 Simultaneous analysis of cationic, anionic and neutral surfactants from different matrices using LCMS/MS.

11:10 – 12:20

Rashi Kochhar[1], Shruti Raju[1], Deepti Bhandarkar[1], Bhairavi Saraf[1], Shailendra Rane[1], Jitendra Kelkar[1], Ajit Datar[1], Zhaoqi Zhan[2]

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Food safety

PTh-166 Detection of Melamine in Human Renal Uric Acid Stone by Matrix-Assisted Laser Desorption / Ionization Time-Of-Flight Mass Spectrometry (MALDI-TOF MS)

13:30 – 14:40

Chia-Fang Wu[1], Chia-Chu Liu[2,3,4,5], Jentaie Shiea[6], Yi-Tzu Cho[7], Yii-Her Chou[2,3], Bai-Hsiun Chen[8], Chao-Yi Chien[1], Shu-Pin Huang[2,3], Wen-Jeng Wu[2,3,9], Jung-Tsung Shen[9], Mei-Yu Chang[9], Chun-Hsiung Huang[2,3], Ai-Wen Chang[2], Ming-Tsang Wu*[1,4,10,11]

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PTh-167 Urinary oxidative metabolites of di(2-ethylhexyl)phthalate can predict the daily intake of phthalate-tainted foods in Taiwanese children

11:10 – 12:20

I-Chen Wu[1], Chia-Fang Wu[2], Jentaie Shiea[3], Bai-Hsiun Chen[4], Jiunn-Ren Wu[5], Ming-Tsang Wu*[2,6,7]

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PTh-168 LC-MS analysis of neonicotinoid insecticides in the crops using a novel selective solid-phase extractant having dipole type functional group

13:30 – 14:40

Toshio Miwa[1], Isao Saito[1], Atsushi Yamamoto[1], Yoshinori Inoue[2], Mitsuru Saito[2]

[1]Chubu University, Aichi, Japan, [2]Nippon Filcon Co., Tokyo, Japan

PTh-169 Studies on Residual Characteristics of Growth Regulator 6-BA in Bean Sprout

11:10 – 12:20

Wan-Hee Seo, Young-Mo Jeong, Soon-Kil Cho, Bong-Suk Oh

Jeonnam Provincial Office, National Agricultural Products Quality Management Service, MIFAFF, Korea

PTh-170 Improvement of Determination Method for Pesticide Residues in Bean Sprout

13:30 – 14:40

Soon-Kil Cho, Wan-Hee Seo, Young-Mo Jeong, Ji-Mi Cho

Jeonnam Provincial Office, National Agricultural Products Quality Management Service, MIFAFF, Korea

PTh-171 Screening of five mycotoxins by using immunoaffinity column and HPLC-orbitrapMS in processed foods

11:10 – 12:20

Dong Sik Jeong, Seung Lim Baek, Dae Hyun Kim, Jong Ho Lee, Cheong-Tae Kim

NONGSHIM Co., LTD., Seoul, South Korea

PTh-172 Simultaneous determination of melamine and its analogues in various processed foods using LTQ-orbitrap HRMS

13:30 – 14:40

JONG HO LEE, DONGSIK JEONG, DAE HYUN KIM, CHEONG-TAE KIM

NONGSHIM Co., Ltd., Seoul, Korea

PTh-174 Determination of DNA adducts originating from methyleugenol using isotope-dilution UPLC-ESI-MS/MS

13:30 – 14:40

Wolfram Engst[1], Kristin Herrmann[1], Fabian Schumacher[1], Simone Florian[1], Klaus E Appel[2], Hansruedi Glatt[1]

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PTh-162
13:30 – 14:40

Analysis of perfluorinated compounds in sediment samples from wastewater canal of Pancevo industrial area, Serbia

Vladimir P Beskoski[1], Shuusuke Takemine[2], Takeshi Nakano[3], Latinka Slavkovic-Beskoski[4], Gordana Gojgic-Cvijovic[1], Mila Ilic[1], Srdjan Miletic[1], Miroslav M Vrvic[1,5]

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Keywords:
PFOA, PFOS, Industrial wastewater canal, Sediment, Danube River

Novel aspects:
This is the first report of presence of PFCs compounds in the sediments from Serbia. Compared to other reports, high levels of PFOA and PFOS were found.

Abstract:
Perfluorinated compounds (PFCs) are chemicals that do not occur naturally, but have been widely used in chemical production for some time. They are globally distributed, environmentally persistent, bioaccumulative, and potentially harmful. Perfluorooctansulfonate (PFOS) and perfluorooctanoate (PFOA) are the two PFCs most commonly used and found in the environment. Together with perfluorohexane sulfonate (PFHxS) these compounds are widely employed in different industrial processes such as in protective coatings.
The wastewater canal (WWC) Vojlovica was built in 1962 to collect the wastewater discharges from the industrial complex of the city of Pancevo in Serbia. Industrial complex consist of a petrochemical factory (HIP Petrohemija) , an oil refinery (NIS Rafinerija, Pancevo) and chemical fertilizers factory (HIP Azotara) . The canal is artificial with no natural flows, about 2 km long, around 70 m wide and directly connected to the Danube River. The water depth is around 12 m. The environment surrounding the canal has been strongly affected for a long time by the presence of the industrial complex. Additionally heavy destruction during NATO bombing events in 1999 resulted in contamination of air, soil, groundwater and the WWC itself.
In total, 4 sediment samples from WWC were collected. Surface sediments layer of 15 cm were taken by a Van Veen Grab sampler, transported in glass jars and stored in the laboratory at 4 °C. For comparative purposes, the same type of sample were also taken from the navigation canal flowing parallel to WWC but not receiving any direct discharge of industrial wastewaters.
Sampling sites are listed below :
No 1 - navigation canal ;
No 2 - at the confluence of WWC with the Danube River, downstream from the industrial area and effluents ;
No 3 - downstream from the fertilizer factory outlet (first effluent) ;
No 4 - downstream from the petrochemical plant (second effluent) ;
No 5 - downstream from the oil refinery outlet (third effluent) .
Sediment sample was extracted with methanol. MPFAC-MXA as mass-labeled surrogates was spiked into the sample. The sample was extracted with SPE. The elution was concentrated and labeled $^{13}C_8$PFOA was added as syringe spike. The each final solution was analyzed by liquid chromatography (LC) -tandem mass spectrometer (MS/MS) using Xevo TQ (Waters) coupled with ACQUITY UPLC (Waters) .
Concentrations of PFCs were determined as follows :
No 1 : 68, 230 and 230 ng/kg-dry of PFOA, PFHxS and PFOS, respectively.
No 2 : 80 and 2100 ng/kg-dry of PFOA and PFOS, respectively.
No 3 : 170 and 5300 ng/kg-dry of PFHxS and PFOS, respectively.
No 4 : 130, 170, and 5700 ng/kg-dry of PFOA, PFHxA, and PFOS, respectively.
No 5 : 76, 66 and 420 ng/kg-dry of PFOA, PFHxA, and PFOS, respectively.
Concentrations of PFOS in the samples No 3 and No 4 are 3 -3.2 times higher compared with sea sediment in Tokyo bay[1)]. PFOA and PFOS concentrations from WWC were from two to twenty fold higher comparing to sediment samples taken from Roter Main river (Germany) which receives treated waste waters of industrial, commercial and domestic origin from municipal wastewater treatment plant[2)]. Comparing to upstream Danube River bank sediment samples[3)] PFOS from the WWC samples were from two to six fold higher.
This is the first study and report of presence of PFCs compounds in the samples from Serbia. Most of the PFCs are released from fertilizer factory and petrochemical plant outlets, while oil refinery outlet mostly contribute to petroleum pollution. The exact origin of PFCs cannot be established from one study but one of the reasons for presence of these compounds might be their usage as components in pipes, fittings and wiring insulations.

1) Zushi Y. et al *Environmental pollution* 158, 756-763 (2010)
2) Becker, A.M et al *Environmental Pollution* 156, 818-820 (2008)
3) Clara, M.et al *Water Research* 43, 4760-4768 (2010)