

*100<sup>th</sup> Anniversary of the Regaining Independence by Poland*



**38<sup>th</sup> International Symposium on Halogenated Persistent Organic Pollutants**

**DioXin 2018**

**& 10<sup>th</sup> International PCB Workshop**

**26 – 31 August 2018, Kraków, Poland**

# Dioxin 2018 Kraków Abstracts Book



Gdańsk University Press

## Gdańsk University Press

**Citation: Dioxin 2018 Kraków Abstracts Book: 38<sup>th</sup> International Symposium on Halogenated Persistent Organic Pollutants & 10<sup>th</sup> International PCB Workshop, 26-31 August 2018, Kraków, Poland. Gdańsk University Press, Gdańsk, 2018**

**ISBN 978-83-7865-713-2**

This is an open access abstracts book distributed under the terms of the [Creative Commons Attribution License](#), which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

## Welcome to Dioxin 2018 Kraków

On behalf of the Organizing Committee, Scientific Committee, and the Dioxin Symposia and PCB Workshop International Advisory Boards, it is with great pleasure that we welcome you to Kraków for the 38<sup>th</sup> International Symposium on Halogenated Persistent Organic Pollutants (POPs) & 10<sup>th</sup> International PCB Workshop : DIOXIN 2018.

The year 2018 marks the 100<sup>th</sup> anniversary of the regaining of independence by Poland. Dreams of freedom have become a reality.

The Dioxin Symposium and International PCB Workshop are recognized as the leading international POPs meetings for scientists and regulators. This year, apart from the International PCB Workshop, the Dioxin Symposium also host the Pre- Dioxin 2018 Students' Symposium "All POPs & Pseudo-POPs" and five Special Sessions (*Biodetection Methods for POPs and Related Food and Environmental Contaminants; European Food Safety Authority Special Session: EFSA Risk Assessments of Persistent Organic Pollutants in Food and Feed; Environmental Persistence, Analytical Methods and Risk of Human and Veterinary Pharmaceuticals that can act as pseudo-POPs; Legacy and Emerging Fluorinated Organic Compounds – Update; and Progress in Industrial Technology and Sustainable Chemistry to Phase out and Control POPs*).

Dioxin 2018 highlights inspiring visions on emerging persistent organic pollutants of food, humans and the environment and highly promotes the involvement of industry in fighting POP pollution and interaction of industry representatives with potential and existing customers and clients in all areas of investigation: analytical, regulatory, exposure assessment, and toxicological aspects relating to Persistent Organic Pollutants. Therefore, the message of the DIOXIN 2018 is: **No boundaries in POPs pollution, research and control.**

Symposium is held in the heart of downtown Kraków. The site for the Students' Symposium and for DIOXIN 2018 closing day is the Auditorium Maximum unit of the Jagiellonian University, and the core Symposium is held at the International Congresses and Entrainment (ICE) Kraków Congress Centre and at the Q Hotel Plus Kraków.

Kraków is historical city with the Royal castle Wawel and perfectly preserved the Old City that is alive cultural heritage. There are numerous restaurants, museums, historical jewels, the old Jewish suburb Kazimierz, theatres, and other attractions within walking distance. Generally, Kraków and the region are highly attractive for tourists and a spacious Kraków historical downtown is crowded in the summer time. We hope that you participate in Dioxin 2018 and look forward to welcoming you to Kraków.

We would like to express our heartiest thanks for all colleagues for great help in organizing the Students Session and Special Sessions and their contributions to the technical and scientific program. We welcome you to Dioxin 2018 in Kraków.

*Jerzy Falandysz*  
Chair

*Larry Robertson*  
Co-Chair

## Organisation

Conference chair: *Professor Jerzy Falandysz* (Gdańsk University, Gdańsk)

ISBN 978-83-7865-713-2

All abstracts are arranged alphabetically using name of first author. Only copy-editing and formatting of abstracts have been done, therefore the authors are responsible for the scientific contents of their abstracts.

## DioXin 2018 Kraków

**Chairman:** Jerzy Falandysz

### 38<sup>th</sup> International Symposium on Halogenated Persistent Organic Pollutants

**Chair:** Jerzy Falandysz University of Gdańsk (Gdańsk)

**Co-Chair:** Larry Robertson The University of Iowa (Iowa City)

### 10<sup>th</sup> International PCB Workshop

**Chair:** Magdalena Urbaniak European Regional Centre for Ecohydrology (Łódź)

**Co-Chair:** Larry Robertson The University of Iowa (Iowa City)

## Organizing Committee

**Marianna Czaplicka** Institute of Environmental Engineering, Polish Academy of Sciences (Zabrze)

**Beate Escher** Helmholtz Centre for Environmental Research – UFZ (Leipzig)

**Jerzy Falandysz** University of Gdańsk (Gdańsk)

**Barbara Gworek** Institute of Environmental Protection (Warszawa)

**Ivan Holoubek** Masaryk University (Brno)

**Allan Astrup Jensen** Nordic Institute of Product Sustainability (Copenhagen)

**Kurunthachalam Kannan** New York State University (Albany)

**Jolanta Kumirska** University of Gdańsk (Gdańsk)

**Danuta Ligocka** Nofer Institute of Occupational Medicine (Łódź)

**Daniela Meloni** Istituto Zooprofilattico Sperimentale del Piemonte Liguria e Valle d' Aosta (Turin)

**Larry Robertson** The University of Iowa (Iowa City)

**Paweł Rostkowski** Norwegian Institute of Air Research (Oslo)

**Anna A Stec** University of Central Lancashire (Preston)

**Xenia Trier** European Environment Agency (Copenhagen)

**Magdalena Urbaniak** European Regional Centre for Ecohydrology (Łódź)

**Roland E Weber** POPs Environmental Consulting (Schwaebisch Gmuend)

**Nobuyoshi Yamashita** National Institute of Advanced Industrial Science and Technology, AIST (Tsukuba)

## International Advisory Boards

### Dioxin Symposium International Advisory Board

**Mehran Alae** National Water Research Institute (Burlington)  
**João Vicente de Assunção** University of Sao Paulo (Sao Paulo)  
**Georg Becher** University of Oslo (Oslo)  
**Paolo Brambilla** University of Milan (Milano)  
**Michael S Denison** University of California (Davis)  
**Jerzy Falandysz** University of Gdańsk (Gdańsk)  
**Heidelore Fiedler** Örebro University (Örebro)  
**Jean-François Focant** University of Liège (Liège)  
**Stuart Harrad** University of Birmingham (Birmingham)  
**Gary Hunt** TRC Environmental Corporation (Lowell)  
**Begoña Jiménez** Institute of Organic Chemistry, CSIC (Madrid)  
**Bruno Le Bizec** Agroalimentaire et de l'Alimentation Nantes Atlantique (Nantes)  
**Stephen H Safe** Texas A&M University (College Station)  
**Shinichi Sakai** Kyoto University (Kyoto)  
**Jae-Ho Yang** Catholic University of Daegu (Daegu)  
**Minghui Zheng** Chinese Academy of Sciences (Beijing)

### PCB Workshop International Advisory Board

**Michael Duffel** University of Iowa (Iowa City)  
**Helen Håkansson** Karolinska Institute (Stockholm)  
**Bernhard Hennig** University of Kentucky (Lexington)  
**Keri Hornbuckle** University of Iowa (Iowa City)  
**Margaret James** University of Florida (Gainesville)  
**Niklas Johansson** Karolinska Institute (Stockholm)  
**Gabriele Ludewig** University of Iowa (Iowa City)  
**Mirek Machala** Veterinary Research Institute (Brno)  
**Takeshi Nakano** Osaka University (Osaka)  
**Isaac Pessah** University of California (Davis)  
**Larry Robertson** University of Iowa (Iowa City), *series organizer*  
**Beatrice Secretan** International Agency for Research on Cancer (Lyon)  
**John Stegeman** Woods Hole Center for Oceans and Human Health (Woods Hole)  
**Peter Thorne** University of Iowa (Iowa City)

## Scientific Committee

**Mehran Alaei** National Water Research Institute (Burlington)  
**Danuta Barańkiewicz** Adam Mickiewicz University (Poznań)  
**Abraham Brouwer** BioDetection Systems b.v. (Amsterdam) and University of Amsterdam (Amsterdam)  
**Carmela Centeno** United Nation Industrial Development Organization, UNIDO (Vienna)  
**Tomasz Ciesielski** Norwegian University of Science and Technology (Trondheim)  
**Adrian Covaci** University of Antwerp (Antwerp)  
**Marianna Czaplicka** Institute of Environmental Engineering, PAS (Zabrze)  
**Michael S Denison** University of California (Davis)  
**Bogdan Długogorski** Murdoch University (Perth)  
**Beate Escher** Helmholtz Centre for Environmental Research – UFZ (Leipzig)  
**Heesoo Eun** Institute for Agro-Environmental Sciences (Tsukuba)  
**Jerzy Falandysz** University of Gdańsk (Gdańsk)  
**Peter Fantke** Technical University of Denmark (Kongens Lyngby)  
**Alwyn Fernandes** University of East Anglia (Norwich)  
**Jean-François Focant** University of Liège (Liège)  
**Janusz Golaś** AGH University of Science and Technology (Kraków)  
**Ewa Gregoraszczyk** Jagiellonian University (Kraków)  
**Adam Grochowalski** Tadeusz Kościuszko University of Technology (Kraków)  
**Jiang Guibin** Research Center for Eco-Environmental Sciences, CAS (Beijing)  
**Barbara Gworek** Institute of Environmental Protection (Warszawa)  
**Helen Håkansson** Karolinska Institute (Stockholm)  
**Stuart Harrad** University of Birmingham (Birmingham)  
**Ivan Holoubek** Masaryk University (Brno)  
**Yuichi Horii** Center for Environmental Science in Saitama (Saitama)  
**Hisato Iwata** Ehime University (Matsuyama)  
**Allan Astrup Jensen** Nordic Institute of Product Sustainability (Copenhagen)  
**Begoña Jiménez** Institute of Organic Chemistry, CSIC (Madrid)  
**Niklas Johansson** Karolinska Institute (Stockholm)  
**Kurunthachalam Kannan** State University of New York (Albany)  
**Olie Kees** University of Amsterdam (Amsterdam)  
**Anna Kilanowicz-Sapota** Medical University of Łódź (Łódź)  
**Jolanta Kumirska** University of Gdańsk (Gdańsk)  
**Paul KS Lam** City University of Hong Kong (Hong Kong)  
**Bruno Le Bizec** Agroalimentaire et de l'Alimentation Nantes Atlantique (Nantes)  
**Danuta Ligocka** Nofer Institute of Occupational Medicine (Łódź)  
**Guorui Liu** Research Center for Eco-Environmental Sciences, CAS (Beijing)  
**Bommanna Loganathan** Murray State University (Murray)  
**Slawo M Lomnicki** Louisiana State University (Baton Rouge)  
**Jan Ludwicki** National Institute of Public Health (Warszawa)  
**Mirek Machala** Veterinary Research Institute (Brno)  
**Rainer Malisch** European Union Reference Laboratory for Dioxins and PCBs in Feed and Food (Freiburg)  
**Daniela Meloni** Istituto Zooprofilattico Sperimentale del Piemonte Liguria e Valle d'Aosta (Turin)  
**Monika Michel** Institute of Plant Protection (Poznań)  
**Hyo-Bang Moon** Hanyang University (Ansan)  
**Takeshi Nakano** Osaka University (Osaka)  
**Tomás Ocelka** CEO at E&H services, Inc. (Ostrava)  
**Jesus Olivero Verbel** University of Cartagena (Cartagena)  
**Józef Pacyna** AGH University of Science and Technology (Kraków)  
**Jadwiga Piskorska-Pliszczynska** National Veterinary Institute (Puławy)  
**Larry Robertson** The University of Iowa (Iowa City)

**Martin Rose** University of Manchester (Manchester)  
**Paweł Rostkowski** Norwegian Institute for Air Research (Oslo)  
**Kenneth Sajwan** Savannah State University (Savannah)  
**Shinichi Sakai** Kyoto University (Kyoto)  
**Anna A Stec** University of Central Lancashire (Preston)  
**Takumi Takasuga** Ehime University (Matsuyama) and Shimadzu Techno-Research Inc. (Kyoto)  
**Sachi Taniyasu** National Institute of Advanced Industrial Science and Technology (Tsukuba)  
**Xenia Trier** European Environment Agency (Copenhagen)  
**Magdalena Urbaniak** European Regional Centre for Ecohydrology (Łódź)  
**Wojciech Wąsowicz** Nofer Institute of Occupational Medicine (Łódź)  
**Roland E Weber** POPs Environmental Consulting (Schwaebisch Gmuend)  
**Si Wei** Nanjing University (Nanjing)  
**Barbara Wyrzykowska-Ceradini** JACOBS Technology, Inc. U.S. EPA RLS Contract Team (Research Triangle Park)  
**Nobuyoshi Yamashita** National Institute of Advanced Industrial Science and Technology (Tsukuba)  
**Leo WY Yeung** Örebro University (Örebro)  
**Gang Yu** Tsinghua University (Beijing)

## Plenary speakers

### Monday, August 27

**Beate Escher** (Helmholtz Centre for Environmental Research – UFZ, Leipzig): “Bioanalytical tools for the assessment of mixtures of organic micropollutants in water, sediment, biota and people”.

### Tuesday, August 28

#### **Kurunthachalam Kannan & Nobuyoshi Yamashita**

(State University of New York, Albany & National Institute of Advanced Industrial Science and Technology, AIST, Tsukuba): “An update on legacy and emerging perfluoroalkyl substances”.

### Wednesday, August 29

**Keri Hornbuckle** (The University of Iowa, Iowa City): “Emissions of Legacy and non-Legacy PCB congeners to air of homes and schools”;

**Larry Robertson** (The University of Iowa, Iowa City): “Hepatic effects of halogenated biphenyls”.

### Thursday, August 30

#### **Richard Hull**

University of Central Lancashire (Preston): “The effect of fire retardants on smoke toxicity”.

### Friday, August 31

**Martin Rose** (Manchester University, Manchester): “Dietary exposure, risk assessment and regulation for legacy and emerging POPs”.



**Students symposium** • Saturday, August 25 • Auditorium Maximum – Jagiellonian University

• All POPs and pseudo-POPs • Paweł Jarosiewicz, Małgorzata Mędyk, Elżbieta Mierzejewska, Patricia N Omo-Okoro, Martyna Saba, Martin Sharkey, Andrew DW Tongue, Nina Wemken • (advisor • Mehran Alae)

**10<sup>th</sup> International PCB Workshop** • August 27 – 30 • Q Plus Hotel Kraków

**Sessions**

- Stockholm Convention, Sources, Exposures, Inventories and Actions to Reduce Exposures • Niklas Johansson, Keri Hornbuckle
- Evolving approaches to assessing exposures and health risks from environmental chemical mixtures • Geniece Lehmann, Mattias Öberg
- Novel Studies on PCB Toxicity and Mechanisms Action • Mirek Machala, Michael Duffel
- PCB Regulations for Health Protection: Recent Actions, Ongoing Initiatives, and Future Perspectives • Helen Håkansson, Vince Cogliano

**38<sup>th</sup> International Symposium on Halogenated Persistent Organic Pollutants** • August 27 – 31 • International Conferences and Entertainment (ICE) Center Kraków / Auditorium Maximum – Jagiellonian University

**Sessions - special**

- Biodetection Methods for POPs and Related Food and Environmental Contaminants • Daniela Meloni, Kenneth Sajwan
- European Food Safety Authority Special Session: EFSA Risk Assessments of Persistent Organic Pollutants in Food and Feed • Ron L Hoogenboom, Tanja Schwerdtle
- Environmental Persistence, Analytical Methods and Risk of Human and Veterinary Pharmaceuticals and Personal Care Products that can act as pseudo-POPs • Beate Escher, Jolanta Kumirska
- Legacy and Emerging Fluorinated Organic Compounds-Update • Nobuyoshi Yamashita, Kurunthachalam Kannan, Leo WY Yeung
- Progress in Industrial Technology and Sustainable Chemistry to Phase out and Control POPs • Roland Weber, Allan A Jensen

## Sessions

- Abiotic Environmental Compartments • [Magdalena Urbaniak](#), [Takashi Nakano](#)
- Advances in Environmental Forensics • [Stephen Mudge](#), [David Megson](#)
- An Analytical Update for Dioxins and Related Halogenated Compounds • [Jean F Focant](#), [Paweł Rostkowski](#)
- Biochemistry and Toxicology of POPs • [Jae-Ho Yang](#), [Anna Kilanowicz-Sapota](#)
- Biomonitoring and Levels: An Update and Obesogens • [Bruno Le Bizec](#), [Heesoo Eun](#)
- Contaminated Sites – Cases, Remediation, Risk and Management • [Barbara Wyrzykowska-Ceradini](#), [Ivan Holoubek](#)
- Dioxins and other POPs in Vietnam and humans after Agent Orange • [Teruhiko Kido](#), [Arnold Schecter](#)
- Ecotoxicology and Environmental Toxicology of POPs • [Hisato Iwata](#), [Minghui Zheng](#), [Jesus Olivero Verbel](#)
- Emission, Control and Cleanup • [Shin-ichi Sakai](#), [Marianna Czaplicka](#)
- Endocrine Disruption: Biochemical and Molecular Mechanisms • [Ewa Gregoraszczuk](#), [Mike Denison](#)
- Endocrine Disruption: Thyroidogenicity, Exposure and Health • [Åke Bergman](#), [Patrik Andersson](#)
- Endocrine Disruption: Multi-models, Mixtures, and Translation • [Tom Muir](#), [MARIKE M Leijts](#)
- Environmentally Persistent Free Radicals • [Bogdan Długogorski](#), [Slawo Lomnicki](#)
- Epidemiology • [Paul KS Lam](#), [Jesus Olivero Verbel](#)
- Exposure – Food Chain, Maternal, Indoor, Occupational and Accidental • [Stuart Harrad](#), [Paolo Brambilla](#)
- Exposure – POPs in Pets and their applicability as Models for Human Health • [Jana Weiss](#), [Hazuki Mizukawa](#)
- Fate and Behavior of Volatile Methylsiloxanes in the Environment • [Yuichi Horii](#), [Nicholas Warner](#)
- Halogenated PAHs and PAHs • [Guorui Liu](#), [Yuichi Miyake](#)
- Legacy and Emerging Flame Retardants: Environmental Levels and Human Exposure • [Gang Yu](#), [Adrian Covaci](#)
- Legacy and Emerging Flame Retardants: Metabolism and Toxicokinetics • [Mohamed Abdallah](#), [Malarvannan Govindan](#)
- Legacy and Emerging Flame Retardants: Identification, New Analytical Methods and Application • [Mehran Alaei](#), [Georg Becher](#)
- Levels in Human Foods and Animal Feeds • [Rainer Malisch](#), [Barbara Gworek](#)
- Mechanisms of Formation and Destruction of Halogenated Dioxins, PAHs, Biphenyls and Similar Compounds • [Olie Kees](#), [Mohammednoor Altarawneh](#)

- Non-target Screening – Multimedia Analysis • [Si Wei](#), [Hyo-Bang Moon](#)
- Organometallic Contaminants • [Danuta Barałkiewicz](#), [Wociek Wąsowicz](#)
- Persistent Biocides and Pesticides • [Bommanna G Loganathan](#), [Monika Michel](#)
- Polychlorinated Naphthalenes and Chlorinated Paraffins (PCNs/CPs) • [Alwyn Fernandes](#), [Vladimir Nikiforov](#)
- POPs and Emerging Contaminants in Developing Countries • [Karla Pozo](#), • [Bondi Gevao](#)
- POPs and Emerging Contaminants in Urban Environment • [Hayley Hung](#), [Zheng Peng](#)
- POPs in Polar, Circumpolar and Alpine Regions • [Begoña Jiménez](#), [Simonetta Corsolini](#), [Tomasz Ciesielski](#), [Igor Eulaers](#)
- QAQC of POPs Analysis – Recent ISO and National Standards • [Sachi Taniyasu](#), [Bommanna G Loganathan](#)
- Risk Assessment and Risk Management • [Martin Rose](#), [Jan Ludwicki](#)
- Sampling, Preparation and Determination • [Anna A Stec](#), [Takumi Takasuga](#)
- Sources, Fate, Transport, Modelling and Inventories • [Heidi Fiedler](#), [Jiang Guibin](#)
- Strategy for a Non-Toxic Environment: Addressing Persistence • [Xenia Trier](#), [Peter Fantke](#)

Thank You to All of our Great Sponsors, Patronages, Exhibitors and Media Covers

DIAMOND



PLATINUM



GOLD



Organisation for the Prohibition of Chemical Weapons

SILVER



BRONZE



Cambridge Isotope  
Laboratories, Inc.  
**isotope.com**



**Agilent Technologies**



**DSP** systems  
The missing link in your laboratory!

EXHIBITORS



PATRONAGES and SUPPORTERS





## TABLE OF CONTENTS

**BIODETECTION METHODS FOR POPs AND RELATED FOOD AND ENVIRONMENTAL CONTAMINANTS (S 1)**

**Behnisch PA, Besselink H, Alygizakis N, Slobodnik J, Brouwer A:** *Effect-based screening of contaminants in effluents from waste water treatment plants in the Danube river basin*

**Behnisch PA, Besselink H, Malonek L, Limone A, Pizzolante A, Pierri A, Ferro A, Gallo A, Buonerba C, Pierri B, Di Stasio A, Cerino P, Durward-Akhurst SA, Schultz NE, Norton EM, Rendahl AK, Geor RJ, Mickelson JR, McCue ME, Brouwer A:** *Blood plasma monitoring of contaminants in humans and domestic animals using a panel of CALUX® bioassays: three case studies*

**Francesse DR, Varello K, Pezzolato M, Prearo M, Bona MC, Abete MC, Squadrone S, Masoero L, Elia AC, Gasco L, Meloni D, Bozzetta E:** *Evaluation of the toxic effects of livestock drinking water by translational studies in vivo and in vitro*

**Kasuya M, Minh Tue N, Goto A, Tanabe S, Kunisue T:** *AhR agonists in Japanese wild birds evaluated by chemical analysis and bioassays*

**Meirong Z:** *Metabolites of chiral pesticides: a blind spot of risk assessment on pesticides*

**Meloni D, Pitardi D, Cavarretta MC, Loprevite D, Freguglia F, Behnisch P, Bozzetta E:** *An effect-based approach for the screening of endocrine disruptors in plastic food contact materials: preliminary data*

**Meloni D, Pitardi D, Olivo F, Cavarretta MC, Loprevite D, Ingravalle F, Pezzolato M, Brouwer A, Behnisch P, Bozzetta E:** *Effect based detection of illicit use of synthetic glucocorticoids in meat producing calf*

**Pan G, Wei S:** *Identification of endocrine disruptors in source water using effect directed analysis and reduced zebrafish transcriptome*

**Schaechtele A, Kraetschmer K, Schill S, Malisch R:** *Evaluation of the EURL proficiency test results on the determination of dioxin-like compounds by bioanalytical screening methods*

**Schafberg M, Lau AE, Krauss UR, Brockmeyer B:** *Towards a cost-effective and rapid toxicological screening method for organic contaminants in marine matrices using HPTLC-bioluminescence detection with *Aliivibrio fischeri**

**Sugihara K, Kawabata K, Sanoh S, Kitamura S, Ohta S:** *Photodegradation of PPCPs in the aquatic environment by sunlight and UV, and the expression of ecotoxicity*

**Vandermarken T, Boonen I, Gryspeirt C, Van Den Houwe K, Denison MS, Goeyens L, Van Hoeck E, Elskens M:** *Estrogenic activity in dry food simulants: chemical migration from paperboard packaging*

**EUROPEAN FOOD SAFETY AUTHORITY SPECIAL SESSION: EFSA RISK ASSESSMENTS OF PERSISTENT ORGANIC POLLUTANTS IN FOOD AND FEED (S 2)**

**Mackay K:** *EFSA's risk assessment on persistent organic pollutants*

**Schwerdtle T:** *PFOS/PFOA in food: Main conclusions of the EFSA risk assessment*

**Barregård L:** *PFOS/PFOA in food: Use of epidemiological data for the EFSA risk assessment*

**Haug L:** *PFOS/PFOA in food: Human biomonitoring*

**Schwerdtle T:** *EFSA's approach for PFASs other than PFOS/PFOA*

**Hoogenboom R:** *Dioxins in food and feed: Transfer and risks of PCDD/Fs and DL-PCBs in farm animals*

**Knutsen H:** *Dioxins in food and feed: Adverse effects of PCDD/Fs and DL-PCBs in humans and revising the TWI*

**Hoogenboom R:** *Dioxins in food and feed: Exposure assessment and human levels of PCDD/Fs and DL-PCBs*



**ENVIRONMENTAL PERSISTENCE, ANALYTICAL METHODS AND RISK OF HUMAN AND VETERINARY PHARMACEUTICALS AND PERSONAL CARE PRODUCTS THAT CAN ACT AS PSEUDO-POPs (S 3)**

**Abdallah MA, Nguyen KH, Ebele JA, Atia NN, Ali HR, Harrad S:** *A single run, rapid polarity switching method for analysis of 30 pharmaceuticals and personal care products in waste water using Q-Exactive+ Orbitrap: application to Egyptian surface water*

**Apel C, Tang J, Joerss H, Ebinghaus R:** *Organic UV stabilizers in the coastal and marine environment of Europe and China*

**Debler F, Koetke D, Gandrass J:** *An automated SPE method for pharmaceuticals in coastal waters*

**Duan L, Zhang Y, Wang B, Yu G:** *Occurrence and spatiotemporal distribution of pharmaceutically active compounds (PhACs) at Beiyun River in Beijing, China: 2013-2017*

**Hung H, Wong F, Shunthirasingham C, Alaei M, Bisbicos T, Pacepavicius G, Smyth SA, Teslic S, Broad K, Marvin C, Jia J, Brown M, Pajda A, Alexandrou N, Luk E, Jantunen L:** *Wastewater treatment plants as a source of synthetic musks in the Great Lakes Region*

**Jiang X, Huang J, Qu Y:** *Occurrence, removal and risk assessment of PPCPs in drinking water plants*

**Kademoglou K, Melymuk L, Klánová:** *Risk-based prioritisation of endocrine disrupting chemicals (EDCs) present in personal care products*

**Kumirska J:** *Selected analytical challenges and new approaches in the preparation of samples for the determination of pharmaceuticals in environmental matrices*

**Nishino T, Kato M, Tojo T, Matsumura C, Hasegawa H, Miyawaki T:** *Risk assessment of pharmaceutical chemicals in the rivers in Tokyo, Japan*

**Van Overmeire I, Vrijens K, Nawrot T, Van Nieuwenhuysse A, Van Loco J, Reyns T:** *Determination of endocrine disrupting compounds in human placenta by UPLC-ESI-MS/MS: a preliminary study on parabens, bisphenols and alkyl phenols*

**Praveenkumarreddy Y, Balakrishna K, Uegaki R, Akiba M, Guruge KS:** *Preliminary studies on temporal variations of antibiotics in sewage treatment plants in South India*

**Rauseo J, Barra Caracciolo A, Ademollo N, Cardoni M, Di Lenola M, Gaze WH, Stanton I, Grenni P, Pescatore T, Spataro F, Patrolecco L:** *Degradation of the sulfamethoxazole antibiotic in an agricultural soil*

**Rauseo J, Spataro F, Ademollo N, Pescatore T, Patrolecco L:** *Pharmaceuticals and endocrine disrupting compounds (EDCs) in the Tiber River (Rome, Italy)*

**Styszko K, Castrignanò E, Kasprzyk-Hordern B, Lechowicz W, Zuba D:** *Drug biomarkers in wastewater from Kraków agglomeration*

**Zhang Y, Duan L, Wang B, Yu G:** *Sewage epidemiology study of antibiotics in flu season in Beijing*

**Zhao G, Zhou H:** *Occurrence of pharmaceuticals and personal care products in Baiyangdian Lake*

## LEGACY AND EMERGING FLUORINATED ORGANIC COMPOUNDS - UPDATE (S 4)

**Aro R, Eriksson U, Kärrman A, Chen F, Wang T, Yeung LWY:** *Per- and polyfluoroalkyl substance (PFAS) homologue profiles, including ultrashort-chain compounds, and extractable organofluorine (EOF) in wastewater treatment plant effluent and sludge from Nordic countries*

**Björnsdotter MK, Yeung LWY, Kärrman A, Ericson Jogsten I:** *Ultra-short-chain perfluoroalkyl substances (PFASs) including trifluoromethanesulfonic acid (TFMS) in environmental waters*

**Bonnet BF, Barck-Holst E, Andersson H, Ahrens L:** *Mass flow and fate of per- and polyfluoroalkyl substances in a landfill*

**Coggan TL, Kolobaric A, Walton F, Szabo D, Moodie D, Clark BO:** *Investigation of the levels of per- and polyfluoroalkyl substances (PFAS) and PFAS precursor compound (PreFAS) contribution in aqueous matrices from Australian WWTPs*

**Drage DS, Wemken N, Abdallah M, Harrad S, Coggins M:** *Concentrations of perfluoroalkyl substances in drinking water, indoor air and dust in Ireland: Implications for human exposure*

**Ericson Jogsten I, Styliano M, Majdak K, Ståhl P, Olsson P-E, Jass J:** *Microbial binding of perfluoroalkyl substances (PFASs)*

**Eun H, Yamazaki E, Taniyasu S, Yamashita N:** *Assessment of perfluoroalkyl substances (PFASs) in open field vegetables*

**Fredriksson F, Yeung LWY, Kärrman A, Eriksson U:** *Comparison of per-/polyfluorinated substances profiles and levels in bird eggs from South Africa and Nordic countries*

**Fu JJ, Gao K, Liu X, Zhang AQ, Song MY, Jiang GB:** *Association between the placental transfer efficiencies and dissociation constant of serum-PFAS complexes*

**Fujii Y, Haraguchi K, Kato Y, Ohta C, Koga N, Kimura O, Endo T, Harada KH, Koizumi A:** *Edible fish is a source of human dietary exposure: perfluorinated alkyl acids in Pacific cods from North Pacific Ocean*

**Gebbink WA, van Leeuwen SPJ, Boon, PE, Mengelers, MJB:** *Contamination of local vegetable gardens with GenX and PFOA near a fluorochemical production plant in the Netherlands*

**Joerss H, Apel C, Ebinghaus R:** *Occurrence and distribution of legacy and emerging per- and polyfluoroalkyl substances (PFASs) in surface waters and sediments of the German North and Baltic Seas*

**Kim H, Kim D-H, Lee J, Kim D-H, Oh J-E:** *The field scale evaluation of uptake of PFASs from rice paddies to rice plant in South Korea*

**Korzeniowski SH, Cockshott K, Bowman J:** *Recent advances in toxicology, biodegradation, water remediation, assessment of alternatives, value-in-use and best practice guidance of short-chain fluorotelomer-based products for various well-known end-uses*

**Leonel J, Nascimento R, Zabaleta I, Bizkarguenaga E, Nunoo DBO, Schultes L, Prieto A, Zuloaga O, Benskin JP:** *Sulfuramid as a source of PFOS in Brazil: what do we know?*

**Makhija DD, Yamashita N, Yamazaki E, Taniyasu S, Thaker PN, Nirmal Kumar JI:** *Per- and polyfluoroalkyl substances (PFASs) pollution in human hair in India*

**Meng P, Deng S:** *An alternative removal strategy for perfluorooctane sulfonate from aqueous film-forming foam solution by aeration-foam collection*

**Meng J, Wang TY, Zhou YQ, Li QF, Lu YL:** *Downward trend of perfluorooctane sulfonate (PFOS) in China: based on dynamic life cycle analysis*

**Morris AJ, Mottaleb MA, Petriello M, Smyth SS, Mudd-Martin G, Moser DK:** *Circulating levels of per- and polyfluoroalkyl substances in subjects undergoing behavioral/lifestyle based interventions for cardiovascular disease risk reduction*

**Motegi M, Takemine S, Horii Y, Minomo K, Ohtsuka N, Nojiri K:** *Biennial survey of perfluoroalkyl and polyfluoroalkyl substances in river water from Saitama Prefecture, Japan during 2009-2017*

**Mullin L, Katz D, Riddell N, Plumb R, Burgess JA, Jogsten I:** *Reduction of LC/MS in-source fragmentation of HFPO-DA through mobile phase additive selection*

**Mumtaz M, Bao YX, Li WC, Huang J:** *Application of Total Oxidizable Precursor (TOP) assay for screening of per and polyfluoroalkyl substances (PFAS) from textile finishing agents available on Chinese market*

**Nguyen HT, Kaserzon SL, Vijayasathya S, Braunig J, Thai PhK, Crosbie ND, Mueller JF:** *Poly-/perfluoroalkyl substances in two large wastewater treatment plants in Australia: Occurrence, temporal trend and mass load*

**Numata J, Kowalczyk J, Schafft H, Lahrssen-Wiederholt L:** *Laying hens and biotransformation of PFAS precursors into PFAAs in eggs*

**Ohno-Woodall K, Janssen M, Weber R:** *Per- and polyfluoroalkyl substances (PFAS) and the Stockholm Convention on Persistent Organic Pollutants*

**Park H, Choo G, Kim H, Oh JE:** *Evaluation of the current contamination status of PFASs and OPFRs in South Korean tap water associated with its origin*

**Phillips S, Braeunig J, Vijayasathya S, Harden F, Hobson P, Mueller JF, Toms L-ML:** *PFAS serum concentrations decline in an Australian child population from 2006 to 2015*

**Qu Y, Huang J, Yu G, Jiang X, Li W, Liu L, Bao Y:** *Monitoring poly- and perfluoroalkyl substances (PFASs) in drinking water treatment plant and distribution system in Changzhou, China*

**Schramm TR, Joerss H, Ebinghaus R:** *Application of the total oxidizable precursor (TOP) assay to evaluate the amount of precursors to perfluoroalkyl acids (PFAAs) in German rivers*

**Schultes L, Vestergren R, Volkova K, Westberg E, Jacobson T, Benskin JP:** *Known and unknown fluorinated compounds in cosmetic products: Fluorine mass balance calculations and human exposure scenarios*

**Sharkey M, Drage DS, Harrad S, Berresheim H:** *Persistent organic pollutants in Irish landfills: a nationwide assessment of BFRs and PFAS*

**Simonnet-Laprade C, Budzinski H, Goutte A, Maciejewski K, Le Menach K, Alliot F, Santos R, Labadie P:** *Potential contribution of targeted and unidentified precursors to the apparent biomagnification of perfluoroalkyl acids (PFAAs) in the food web of an urban river*

**Suzuki Y, Kitao R, Tanaka S, Yukioka S, Mizukami-Murata S, Ogawa F:** *Formation of PFOS and other metabolites from N-Ethyl perfluorooctane sulfonamidoethanol (N-EtFOSE) during an exposure experiment to Japanese medaka*

**Thaker PN, Yamazaki E, Taniyasu S, Yamashita N, Makhija DD, Nirmal Kumar JI:** *Historical reconstruction of per- and polyfluoroalkyl substances pollution in Cooum river, India by the Great South India Floods in 2015*

**Toms L-ML, Braeunig J, Vijayasathya S, Phillips S, Aylward L, Hobson P, Mueller JF:** *15 years of biomonitoring: PFAS serum concentrations decline in an Australian population from 2002 to 2017*

**Wang SQ, Wang XH, Yamashita N, Yamazaki E:** *Per- and polyfluoroalkyl compounds (PFCs) in gaseous and particulate phase from Xiamen, Chian*

**Wang TY, Zhou YQ, Meng J, Chen SQ:** *Occurrence, mass flux, and risk ranking of emerging pollutants in municipal wastewater treatment plants*

**Yamazaki E, Taniyasu S, Lam CWJ, Wang XH, Yamashita N:** *Per- and polyfluoroalkyl substances as chemical tracer for oceanography*

**Yamazaki E, Taniyasu S, Noborio K, Falandysz J, Eun H, Yamashita N:** *Potential accumulation of per- and polyfluoroalkyl substances in rice (*Oryza sativa* subsp. *Indica*)*

**Yeung LWY, Aro R, Fredriksson F, Eriksson U, Chen F, Wang T, Kallenborn R, Kärrman A:** *Mass balance analysis of extractable organofluorine in environmental samples from the Nordic Countries*

**Zhu L, Chen M, Chen W, Wang Q:** *Partitioning and bioaccumulation of emerging and legacy per- and polyfluoroalkyl substances in Taihu Lake, China*

**Zhou Y, Wang S, Ding G, Chen C, Chen H, Li Y, Wang X:** *Levels and transportation of polyfluoroalkyl substances (PFASs) in the water and suspended particulate matter in the marine coastal environment of China, from the Yellow Sea to the South China Sea*

**Zhou YQ, Wang TY, Li QF, Wang P, Li L, Chen SQ, Zhang YQ, Khan K, Meng J:** *Spatial and vertical variations of perfluoroalkyl acids (PFAAs) in the Bohai and Yellow Seas: Bridging the gap between riverine sources and marine sinks*

#### **PROGRESS IN INDUSTRIAL TECHNOLOGY AND SUSTAINABLE CHEMISTRY TO PHASE OUT AND CONTROL POPs (S 5)**

**Centeno C, Tyrkko K:** *UNIDO POPs program and Circular Economy: Addressing the challenge of persistent organic pollutants in the recycling chain*

**Fantke P, Hauschild MZ, McKone TE:** *Risk and sustainability: trade-offs and synergies for robust decisions*

**Franke V, Schäfers M, Lindberg JJ, Lakshmanan R, Ahrens L:** *Removal of per- and polyfluoroalkyl substances from drinking water using ozonation combined with a heterogeneous catalyst and persulfate*

**Jiang C, Zheng Z, Wang H, Tian Y, Sun Y, Huang J:** *To reduce and phase out PFOS in China: a technical roadmap under a GEF project*

**McDowall G, Bluteau T:** *Eliminating the use of PFAS and Glycols used in the formulations of fire-fighting foams – An opportunity to embrace a sustainable outcome when fighting fires*

**Omo-Okoro PN, Daso AP, Okonkwo OJ:** *Per- and polyfluoroalkyl substances (PFAS): Ubiquity, levels, toxicity and their removal from aqueous media using novel agro-based adsorbents*

**Slijkhuis Ch:** *Recycling plastics from WEEE requires a sensible and practical approach on POPs*

**Wagner S, Schlummer M, Mäurer A, Tange L, Noordegraaf J:** *Recycling of EPS waste containing HBCDD – The PolyStyrene Loop*

## 10<sup>th</sup> INTERNATIONAL PCB WORKSHOP

### STOCKHOLM CONVENTION, SOURCES, EXPOSURES, INVENTORIES AND ACTIONS TO REDUCE EXPOSURES (S 6)

**Ewald JM, Martinez Aranedo AJ, Mattes TE, Schnoor JL, Hornbuckle KC:** *PCB dechlorination hotspots and reductive dehalogenase genes in a contaminated wastewater lagoon*

**Haven RØ, Hauge Smith K, Dalvang L, Butera S, Thorman J:** *Thermal treatment technologies for polychlorinated biphenyls (PCB) in buildings and demolition waste*

**Hirai Y, Sakai S:** *Emission factor for polychlorinated biphenyls (PCBs) from PCB waste storage sites*

**Jahnke JC, Hornbuckle KC:** *PCB Emissions from paint: Using the PUF-PES method to measure volatilization*

**Johansson N, Andersson L, Bogren T, Gullberg J, Krische R, Rångeby M:** *Sources to and transport of PCB via the Stream Väsbyån to Lake Oxundasjön in Upplands Väsby, Sweden*

**Kolarik B, Björkqvist S, Kampmann K:** *Remediation of PCB contaminated buildings - the impact of temperature changes on effectiveness of encapsulation*

**Langeland M:** *Big data: National investigation of PCBs in indoor air in homes, offices, institutions, universities, laboratories, storage spaces and workshops*

**Martinez A, Awad AM, Herkert NJ, Hornbuckle KC:** *Determination of PCB fluxes from Indiana Harbor and Ship Canal using dual-deployed air and water passive samplers*

**van Hoeymissen J, van den Acker W, Raedschelders S:** *PCB emissions from scrap metal recycling plants in Flanders, Belgium: an ongoing assessment*

**Xu Y:** *Microbial dechlorination of polychlorinated biphenyls (PCBs) in Taihu lake sediment microcosms*

### EVOLVING APPROACHES TO ASSESSING EXPOSURES AND HEALTH RISKS FROM ENVIRONMENTAL CHEMICAL MIXTURES (S 7)

**Capozzi SL, Jing R, Rodenburg LA, Kjellerup BV:** *Positive matrix factorization analysis shows dechlorination of polychlorinated biphenyls during domestic wastewater collection and treatment*

**Carlson LM, Pradeep P, Gift J, Davis A, Henning C, Hong T, Patlewicz G, Lehmann GM:** *Sufficient similarity evaluation of PCB mixtures: A case study using rodent carcinogenicity data*

**Frederiksen M, Knudsen LE, Kolarik B, Haug LS, Broadwell SH, Frøshaug M, Thomsen C, Egsmose EL, Gunnarsen L, Ovesen SL, Andersen HV:** *PCB in blood, air, dust, wristbands, hand and surface wipes after PCB exposure in dwellings*

**Lehmann GM, Rice G, Haddad S:** *Human health risk assessment of chemical mixtures: Case study of PCBs*

**Palát J, Codling G, Schacht V, Klánová J:** *Polychlorinated biphenyls (PCBs) in human serum*

**Yesildagli BU, Karagoz C, Hunc F, Arslanbas D, Yucesoy G, Dillioglugil MO, Filiz S, Gunlemez A, Yilmaz Civan M:** *PCB levels in maternal serum*

**Rawn DFK, Sadler AR, Liao X, Feeley M:** *Polychlorinated biphenyl concentrations in Canadian salmon – revisiting the issue*

**Santos LL, Hatje V, Leonel J:** *Occurrence and distribution of PCBs in oyster from Todos os Santos Bay, North-eastern Brazil*

**Saktrakulkla P, Wang K, Hornbuckle KC:** *A mathematical model for predicting the relative responses of unidentified OH-PCBs*

**Savage DT, Hilt JZ, Dziubla TD:** *Analyte-responsive nanoparticles for the detection of polychlorinated biphenyls*

## NOVEL STUDIES ON PCB TOXICITY AND MECHANISMS ACTION (S 8)

**Duffel MW, Rodriguez EA, Tuttle K, Lehmler H-J, Robertson LW:** *Sulfation in the transport and toxicity of lower-chlorinated PCBs*

**Erickson MD:** *Environmental PCB forensics: Processes and issues*

**Ghosh S, Mitra PS, Loffredo CA, Palkovicova Murinova L, Trnovec T, Sovcikova E, Jureckova D, Rausova K, Noreen Z, DeJesus J, Nnanabu T, Vilmenay K, Makambi KM, Nunlee-Bland G:** *Global gene-expression and pathway analysis of new born PCB-exposed Slovak children - perspectives on future disease and disorder development*

**Ludewig G, Flor S, Klenov V, Wang H, Adamcakova-Dodd A, Thorne P, Robertson L:** *Rat PCB inhalation study: what can we learn about the effects of a school indoor air mixture?*

**Esteban J, Barber X, Sánchez-Pérez I, Alarcón S, Wimmerová S, Palkovicova Murínová L, Conka K, Jurecková D, Trnovec T, van der Ven L, Viluksela M, Håkansson H:** *Modulation of retinoid homeostasis by PCBs and related compounds*

**Inui H, Goto E, Haga Y, Kubo M, Itoh T, Kasai C, Shoji O, Yamamoto K, Matsumura C, Nakano T:** *Enhanced metabolism of 2,3',4,4',5-pentachlorobiphenyl (CB118) by bacterial cytochrome P450 monooxygenase mutants*

**Hennig B:** *Modulation of PCB-induced inflammatory diseases by lifestyle changes: Implications in atherosclerosis*

**Lein PJ, Sethi S, Keil KP, Yang D, Wayman GA:** *The developmental neurotoxicity of legacy vs. contemporary PCBs: similarities and differences*

**Liu Y, Chen Y, Jin G, Wu Y:** *Human P450-dependent activation of polychlorinated biphenyls: mutagenicity, enzymes required, and structure-activity relationships*

**Pěničková K, Svržková L, Strapáčová S, Neča J, Bartoňková I, Dvořák Z, Hýžd'álová M, Pivnička J, Pálková L, Lehmler HJ, Li X, Vondráček J, Machala M:** *In vitro profiling of toxic effects of prominent environmental lower-chlorinated PCB congeners linked with endocrine disruption and tumor promotion*

**Slavík J, Pěničková K, Svržková L, Šimečková P, Procházková J, Vondráček J, Machala M:** *Sphingolipid metabolism, autophagy and plasma membrane proteins are potential targets of non-dioxin-like PCB 153 in rat liver epithelial cells*

**Šimečková P, Pěničková K, Slavík J, Svržková L, Procházková J, Vondráček J, Machala M:** *PCB 153 - induced changes in sphingolipid metabolism are potentially linked with alterations of intercellular communication in a model of non-tumorigenic rat liver epithelial cells*

## PCB REGULATIONS FOR HEALTH PROTECTION: RECENT ACTIONS, ONGOING INITIATIVES, AND FUTURE PERSPECTIVES (S 9)

**Ali I, Högberg J, Korhonen A, Stenius U:** *CRAB3: A text mining approach to evaluate PCB toxicity for health risk assessment*

**Barlow S:** *The JECFA ndl-PCB safety evaluation. Findings, including gaps, and ways forward*

**Capozzi SL, Kjellerup BV:** *Colonization and growth of PCB respiring biofilms on carbonaceous amendments*

**Cogliano V:** *The IARC 2016 cancer evaluation: Research directions to help public health agencies move forward*

**Hoogenboom LAP:** *How toxic is PCB 126 in humans?*

**Lehmann GM, Carlson LM:** *Update on the progress and goals of U.S. EPA's integrated risk information system Assessment of PCBs*



**Ohno-Woodall K, Camelo E, Dittkrist J, Fiedler H:** *Evaluating the progress in the elimination of PCB as required under the Stockholm Convention on persistent organic pollutants (interim report)*

**Takeda R:** *Parental electro cardio graphies (after 50 Years) of Yusho victims who are left behind*

**Udugama GK, Werahera SM, Centeno CR:** *Challenges and recent developments in managing polychlorinated biphenyls (PCBs) in Sri Lanka*

**Verstraete F:** *EU policy to prevent and reduce the presence of PCBs (DLs and NDLs) in food and feed*

## 38<sup>TH</sup> INTERNATIONAL SYMPOSIUM ON HALOGENATED PERSISTENT ORGANIC POLLUTANTS

### ABIOTIC ENVIRONMENTAL COMPARTMENTS (S 10)

**Barčauskaitė K, Mažeika R:** *Quality and risk assessment of sewage sludge composts*

**Bastiaensen M, Been F, Lai FY, van Nuijs A, Covaci A:** *Mining the chemical information of urban wastewater - Monitoring human exposure to phosphorous flame retardants and plasticizers (PFRs)*

**Čonka K, Drobná B, Stachová Sejáková Z, Gago F, Oravcová P, Fabišíková A, Dömötörövá M, Kočan A:** *Dioxin pattern of environmental samples, feed and food in polluted sites in Slovakia*

**Folarin BT, Abdallah MA, Oluseyi T, Harrad S, Olayinka K:** *Toxic equivalent concentrations of dioxin-like PCBs in soil samples from the vicinity of electrical power stations in Lagos, Nigeria*

**Han H-S, Kim Y-J, Song I-S, Bae Y-S, Lee Y-K, Kim D-G, Park I-B, Kim J-S:** *Concentrations of atmospheric PCDDs/PCDFs and PCBs in Gyeonggi and nearby area*

**Jia L, Deng Y, Mao W, Yin H, Tao F, Huang F:** *Levels of PCDD/Fs in soils in the vicinity of the municipal solid waste incinerator in Shanghai, China*

**Koshiha J, Hirai Y, Sakai S:** *Panel data analysis of environmental PCB in Japan: national and local concentration trends*

**Kwon SY, Seo S-H, Chang Y-S:** *Fate and compositional profiles of perfluoroalkyl substances (PFASs) in multimedia environments*

**Lunder Halvorsen H, Moeckel C, Pedersen LS, Krogseth IS, Bohlin-Nizzetto P, Schlabach M, Breivik K:** *Passive air sampling of POPs in background air along a European-Arctic transect*

**Mukai K, Fujimori T, Anh HQ, Fukutani S, Oshita K, Takaoka M, Takahashi S:** *Speciation of extractable organohalogenes according to molecular size in various environmental matrices*

**Nakano T:** *Disaster and chemicals contamination*

**Organtini K, Rosnack K, Cleland G:** *LC-MS/MS analysis of polyfluoroalkyl substances in surface, ground, and waste water samples*

**Ruggeri MF, Poma G, Malarvannan G, Covaci A, Puliafito SE, Altamirano JC:** *Preliminary assessment of OPEs levels in atmospheric samples from Mendoza City, Argentina*

**Takasuga T, Nakano T, Shibata Y:** *Hexachlorobutadiene (HCB) as predominant POPs in ambient air: all POPs levels and trends at frequent monitoring super-sites of Japan*

**Trinh M-H, Tsai Ch-L, Chang M-B:** *Characterization of polybromodiphenyl ethers (PBDEs) in various aqueous samples in Taiwan*

**Urbaniak M, Kiedrzyńska E, Wyrwicka A, Zieliński M:** *Holistic approach to the problem of river contamination by selected POPs and possibilities for their removal using environment friendly technologies: the case of Pilica River (Central Poland)*

#### ADVANCES IN ENVIRONMENTAL FORENSICS (S 11)

**Abercrombie V, Anumol T, Serrano-Izaguirre G, Provoost L, Lee J:** *Increased reproducibility in the analysis of EU and EPA PAH's with the Agilent Select PAH GC column and Metal Microfluidic Guard Chip Technology by gas chromatography*

**Addink R, Shirkhan H, Germansderfer P, Hall T:** *Simple, quick, low cost high throughput sample clean up for dioxins, PCBs and PBDEs analysis*

**Ballesteros-Gómez A, Björnsdotter MK, Dueñas-Mas MJ, Rubio S:** *Screening of color developers (bisphenol A alternatives) in thermal paper and indoor dust*

**Monti C, Mudge SM, Rose N, Negley T:** *Integrating a PCDD/F fingerprint study, using the 190 nontoxic congeners, with Hg isotopes: first results*

**Mudge SM, Monti C:** *PCB and PCDD/F source allocation around Taranto, Italy*

**Gill R, Sarala R, Tarrant D, Takaku-Pugh S, Lytle E, Brown RF, Park J-S, Petreas M:** *Effective screening of furnishings for flame retardants*

**Hall T, Addink R, Shirkhan H, Germansderfer P:** *Analysis of organochlorine pesticides and semi-volatiles in drinking water with semi-automated solid phase extraction*

**Kelterer K, Nickel M:** *Lean management and "One-Piece-Flow" for PCDD/F and PCB analysis to reduce the turn-around time in smaller laboratories compared to classical batch operation*

**Megson DM, Jones R, Johnson G, Brown T, Sandau C:** *How many PCBs are there in my sample and where do they come from?*

**Miralles-Marco A, Schacht V, Codling G, Klánová J:** *Applicability of a new UHPLC-HRMS/MS (Orbitrap) method suitable for screening, quantification and confirmation of organic pollutants and residues in food composites*

**Mumtaz M, Bao YX, Li WC, Huang J:** *Application of total oxidizable precursor (TOP) assay for screening of per and polyfluoroalkyl substances (PFAS) from textile finishing agents available on Chinese market*

**Nikiforov VA:** *Structural variation, simple nomenclature, LC and MS-MS characterization of commercially available perfluoroethercarboxylic acids (PFECAs)*

**Ovesen SL, Andersen HV, Knudsen LE, Frederiksen M:** *Sampling PCB with silicone wristbands as a measure for personal exposure in contaminated buildings*

**Riener J, Wong D, Walker D, Anumol T:** *Dioxin analysis in water by isotope dilution using triple quadrupole GC/MS*

**Ross I, Horneman A, Miles J, Hurst J, Houtz E:** *Detailed site investigation for per-and polyfluoroalkyl substances (PFASs) using advanced analytical tools*

**Stultz C, Dorman F L:** *Kovats and Lee retention indices for characterization of PCBs, PCNs, and Dioxins*

**Wright M, Hope D, Pond P, Hope K, del Pozo J:** *Moving from ASTM 5790-95 to isotope dilution for OCPs by GC-MS/MS*



## AN ANALYTICAL UPDATE FOR DIOXINS AND RELATED HALOGENATED COMPOUNDS (S 12)

**Behzadi H:** *Do's and don'ts of PFAS sampling and more*

**Choi JD, Shin Ch, Lim TS, Lee JE, Lee W-H, Kang G-J:** *Determination of polybrominated biphenyls (PBBs) in food by gas chromatography coupled to electron ionization high-resolution mass spectrometry*

**Eguchi A, Enomoto T, Mikami S, Mori C:** *Investigation of analytical method for PCBs in serum sample using mini SPE cartridge with intelligent autosampler and gas chromatography - mass spectrometry*

**Kukučka P, Audy O, Geng D, Stableski J, Ericson-Jogsten I, Klánová J:** *Application of gas chromatography atmospheric pressure chemical ionization mass spectrometry for analysis of contaminants in environmental samples*

**Matsukami H, Hashimoto S, Suzuki G:** *GC-APCI/LC-ESI/QTOF-MS for the determination of brominated dioxins and brominated flame retardants released from flame-retarded product handling plants*

**Mehlmann H, Krumwiede D:** *Latest advancements for maximized productivity for PBDE, dioxin and PCB analysis using DualData Mode with magnetic sector GC-HRMS*

**Mukai K, Fujimori T, Shiota K, Nishimura C, Ito N, Takaoka M:** *Quantitative speciation of chlorine in electronic waste open burning soils: focus on water-insoluble fractions*

**Neugebauer F, Dreyer A, Lohmann N, Koschorreck J:** *Analysis of dechloranes and emerging brominated flame retardants with a multi-compound multi-matrix method and GC-API-MS/MS*

**Puype F, Ackermann L:** *Evaluation of direct analysis in real time – high resolution mass spectrometry (DART-HRMS) for WEEE specific substance determination in polymers*

**Qu GB, Wang YW, Shi JB, Ruan T, Liu JY, Song MY, Liu RZ, Liu AF, Zhang HY, Lin YF, Zeng LX, Yuan B, Ma QC, Liu GR, Zheng MH, Jiang GB:** *Identification of emerging pollutants in the environment*

**Rodrigues Da Silva C, Kelterer K, Souza CAM, Niwa NA, Tominaga MY, Masini JC:** *A simplified and efficient manual fractionation procedure for the simultaneous determination of PCDD/Fs, PCBs and PBDEs in environmental samples*

**Sakatani K, Takahashi K, Takenaka S, Kajiwara J, Katsuki S, Mitoma C, Furue M:** *Ionic liquid extraction for the determination of polychlorinated dibenzo-p-dioxins, polychlorinated dibenzofurans, and dioxin-like polychlorinated biphenyls in soil and sediment*

**Shelepchikov AA, Turbabina KA, Ovcharenko VV, Brodsky ES, Kozhushkevich AI, Mir-Kadyrova EYa, Kalantaenko AM, Komarov AA, Nikulin VV:** *Solid phase extraction of PCDDs/PCDFs and dioxin-like PCBs from oils and fats*

**Shellie R, Ragunathan K, Gooley A, Jones R:** *The analysis of 209 PCB congeners using a novel capillary GC column stationary phase*

**Stefanuto P-H, Scholl G, Miklášová Z, Stumpf C, Haedrich J, Focant J-F:** *Food and feed control using GC×GC-(MR)TOFMS: Dioxin measurements and beyond*

**Takakura M:** *Comparison of the analysis result of dioxins in several hundreds of food and feed samples by using GC-MS/MS and Sector GC-MS. Part 1*

**Takakura M:** *Comparison of the analysis result of dioxins in several hundreds of food and feed samples by using GC-MS/MS and Sector GC-MS. Part 2*

**Takakuwa H, Tobou K, Okuda M, Nakamura S, Nakano T:** *Analysis of polychlorinated dibenzo-p-dioxin and dibenzofurans in fly ash according to Japanese official method using gas chromatography triple quadrupole mass spectrometry with high efficiency EI source*

**Takemori H, Matsushita T, Tsujisawa Y, Inoue T, Takasuga T:** *Evaluation of Orbitrap GC-MS for dioxins and POPs analysis*

**Urbancova K, Sram RJ, Hajslova J, Pulkrabova J:** *A new method for the simultaneous determination of phthalate and DINCH metabolites in human breast milk*

### BIOCHEMISTRY AND TOXICOLOGY OF POPs (S 13)

**Drwal E, Rak A, Gregoraszczyk EL:** *Cell type dependent mechanism of polycyclic aromatic hydrocarbons (PAHs) mixtures action in human placental cells*

**Drwal E, Rak A, Gregoraszczyk EL:** *Two real life mixtures of polycyclic aromatic hydrocarbons (PAHs) have modulatory effect on hormonal status of human placenta cells*

**Ertürk Arı P, Çakmak G, Ari A, Schins R, Burgaz S, Gaga EO:** *Genotoxicity of polycyclic aromatic hydrocarbons (PAHs) in size segregated PM samples collected from a thermal power plant area*

**Feng W, Zheng J, Mckinie SMK, Gamal El, Dong Y, Agarwal V, Fenical W, Kumar A, Cao Z, Moore BS, Pessah IN:** *Anthropogenic and biogenic organohalogen target and disrupt intracellular Ca<sup>2+</sup> dynamics*

**Gogola J1, Hoffmann M1, Ptak A:** *Persistent endocrine-disrupting chemicals in human follicular fluid stimulate proliferation in granulosa tumor spheroids*

**Kakutani H, Yuzuriha T, Nakao T, Ohta S:** *Dioxins disrupt the biological barrier function by aryl hydrocarbon receptor*

**Koch C, Nachev M, Klein J, Köster D, Schmitz OJ, Schmidt TC, Sures B:** *Toxicity of degradation products of the commercially used polymeric flame retardant PolyFR following UV irradiation and heat treatment*

**Lee YJ, Park SJ, Yang JH:** *IgE-independent activation of mast cells by perfluoroalkyl compounds*

**Leonards P, Viberg H, Lee I, Buratovic S, Eriksson P:** *Metabolomics used to link molecular pathways with mice behaviour after a single dose of pesticides or PFHxS*

**Luo Q, Li F, Xiang B:** *Roles of dysregulation of lipid metabolism in the development of lung cancer induced by PAHs exposure*

**Ohta C, Yamamoto K, Fujii Y, Haraguchi K, Kimura O, Endo T, Kato Y, Koga N:** *In vitro metabolism of 2,2',3,4',5,6,6'-heptachlorobiphenyl (CB188) by rat liver microsomes*

**Qi Y, Wada H:** *Effects of decabromodiphenyl Ether (BDE-209) on ultrasonic communication in fighting of male adult rats*

**Sheng N, Wang JH, Pan YT, Dai JY:** *Comparison of toxicity between perfluorooctanoic acid (PFOA) and novel alternative hexafluoropropylene oxide trimer acid (HFPO-TA)*

**Søfteland L, Olsvik PA:** *Toxicological application of co-culture of primary Atlantic salmon hepatocytes and kidney epithelial cells exposed to glyphosate, chlorpyrifos, benzo(a)pyrene and cadmium*

**Wei Y, Xing X, Kang J, Qiu J, Zhong X:** *Exposure to PBDEs impedes vascular development and alters gene expression related to angiogenesis and barrier function*

**Wnuk A, Rzemieniec J, Kajta M:** *The effects of prenatal exposure to chemical UV-filter benzophenone-3 (BP-3) in the neuronal cells*

**Yang JH, Lee YJ:** *Perfluorohexanesulfonate induces apoptosis of neural cell via NMDA receptor and subsequent PKC activation*

**Yuzuriha T, Kakutani H, Nakao T, Ohta S:** *Investigation on effect of organophosphorus flame retardants (PFRs) on metabolic disease related receptors*

**Zajda K, Gregoraszczyk E:** *Composition dependent mechanisms of PAH mixtures action as tumor promotor and progressor in non-cancer and cancer ovarian granulosa cells*

## BIOMONITORING AND LEVELS: AN UPDATE AND OBESOGENS (S 14)

**Fišerová P, Kohoutek J, Klánová J:** *Determination of 18 phthalate metabolites and 2 alternative plasticizer metabolites in urine using high-throughput off-line SPE and LC-MS/MS*

**Fridén U, Aune M, Bignert A, Cantillana T, Glynn A, Gyllenhammar I, Lignell S:** *Levels of persistent organic pollutants (POP) in human milk from first-time mothers in Uppsala, Sweden: temporal trends for the time period 1996-2016*

**Helou K, Harmouche KM, Matta J, Sayegh N, Karaki S, Mahfouz M, Mahfouz Y, Narbonne J-F:** *Relationship between socio-demographic factors, dietary habits and anthropometric measures and PCBs, OCPs, dioxins, and furans in blood and breast milk of a group of Lebanese primiparous lactating women*

**Hijiya M, Chiga H, Matsumura T, Sato N, Chisaki:** *Abundance ratio of dioxins in human blood fraction*

**Kunisue T, Egashira K, Isobe T, Nakayama K, Matsuishi T, Tajima Y, Yamada TK, Tanabe S:** *Temporal trend analyses of POPs in three toothed whale species stranded along the Japanese coastal waters: importance of samples and data stored in es-BANK and ChemTHEATRE*

**Loganathan BG:** *POPs and obesity - spatial and temporal trends*

**Lohmann N, Neugebauer F, Dreyer A, Ruedel H, Teubner D, Koschorreck J:** *Emerging Flame Retardants and Legacy POPs in Bream and Other Limnic Samples of the German Environmental Specimen Bank*

**MacDonald AM, Kinniburgh DW, Gabos S, Lee B, Cheung PY, Ackah F, Reichert M, Graydon J, Lyon A, Jarrell J, Benade G:** *Biomonitoring of environmental chemicals in pooled pregnant women and cord blood serum samples: Results from the third phase of the Alberta biomonitoring program*

**Malarvannan G, Van Hoorenbeeck K, Deguchteneere A, Verhulst SL, Jorens PhG, Dirinck E, Van Gaal L, Covaci A:** *Persistent organic pollutants in human serum from obese adolescents and adults undergoing weight loss treatment*

**Ohta S, Kakutani H, Yuzuriha T, Nakao T:** *A mixture of TBBPA and TCDD disrupts adipocyte and osteoblast differentiation in human mesenchymal stem cells*

**Petrlik J, Teebthaisong A, Bell L, Behnisch PA, Da M, Saetang P, Ritthichat A, Kalmykov D:** *PCDD/Fs and PCBs in eggs - data from China, Kazakhstan and Thailand*

**Pourchet M, Cariou R, Antignac JP, Le Bizec B:** *Screening emerging chemicals in human matrices to support biomonitoring and environmental health studies: methods, challenges and promises*

**Sajwan KS, Richardson JP, Powell B, Patel B, Rowan C:** *Environmental obesogens: contamination levels in environmental and biological samples from Savannah, Georgia, USA*

**Schacht VJ, Codling GP, Palát J, Klánová J:** *Multi residue screening of human serum using high-resolution GC Orbitrap*

**Sjödin A, Jones R, Vuong AM, Stapleton HM, Yolton K, Lanphear BP, Chen A:** *Polybrominated diphenyl ethers measured in serum of children enrolled in the HOME study*

**Van Overmeire I, Joly L, Malarvannan G, Poma G, Covaci A, Colles A, Koppen G, Den Hond E, Van de Mierop E, De Wolf M-Ch, Charlet F, Malysheva SV, Vanhouche M, Dussart A, van Loco J, Van Nieuwenhuyse A, Andjelkovic M:** *Levels of organochlorinated pesticide residues and other persistent organic pollutants in breast milk: the Belgian results from the 6th WHO-coordinated survey*

**Zafeiraki E, Hoogenboom RLAP, Gebbink WA, Dassenakis E, van Leeuwen SPJ:** *Occurrence of perfluoroalkyl substances (PFASs) in European eel (*Anguilla anguilla*) and related human dietary exposure*

## CONTAMINATED SITES - CASES, REMEDIATION, RISK AND MANAGEMENT (S 15)

**Akortia E, Lupankwa M, Okonkwo JO:** *Transport and retention of polybrominated diphenyl ether in soil from e-waste dump in Ghana and landfill site in South Africa: A laboratory-scale column soil flushing approach*

**Choi GH, Song AR, Moon BY, Jung GH, Park JH, Ryu SH, Lim SJ, Park BJ:** *Endosulfan uptake of perilla shoot and decrease of endosulfan uptake and soil concentration by granular activated carbon amendment*

**De la Torre A, Navarro I, Sanz P, Arjol MA, Fernández J, Martínez MA:** *Dumpsite dismantling influence on HCH air levels: Sabiñánigo case*

**Folarin BT, Abdallah MA, Oluseyi T, Harrad S, Olayinka K:** *Concentrations of polychlorinated biphenyls in soil and indoor dust associated with electricity generation facilities in Lagos, Nigeria*

**Karunaratne DGGP, Welmillage SU, Jinadasa KBSN, Jayatilake A, Werahera SM, Weber R:** *National inventory of unintentional persistent organic pollutants, polycyclic aromatic hydrocarbons, short lived climate pollutants, and BTEX for Sri Lanka*

**Kurt-Karakus P, Odabasi M, Birgul A, Yaman B, Gunel E, Dumanoglu Y:** *Environmental contamination by obsolete pesticide stockpiles in Turkey: Case study for Derince Province*

**Monfort O, Hanna K:** *Ferrate(VI) oxidation as promising treatment in remediation of soil contaminated by PCBs*

**Niarchos G, Söregård M, Jensen PE, Ahrens L:** *Electro dialytic remediation of per- and polyfluoroalkyl substance (PFAS) - contaminated soil*

**Noone C, Houlihan M, Keogh M, Ó Riordain C, Smith H, Tierney J:** *An investigation of elevated dioxin levels in ovine livers in Ireland*

**Pandelova M, Bussian BM, Henkelmann B, Schramm K.-W:** *Soil-water partition coefficients (K<sub>d</sub>) and translocation of POPs in soils*

**Ross I, Lagowski J, Dickson M, Storch P:** *Full-scale treatment of PFAS-impacted wastewater using ozofractionation with treatment validation using TOP assay*

**Tagliabue M, Bagatin R, Careddu G, Manuela G, Perucchini S, Bellettato M, Montanari E:** *Effect of attrition on pesticide contaminated soil*

**Teebthaisong A, Petrlik J, Ritthichat A, Saetang P, Strakova J:** *POPs contamination at 'recycling' and metallurgical site in Thailand*

**Thomsen C, Haug LS, Casas M, Robinson O, Chatzi L, Gražulevičienė R, Slama R, Wright J, Meltzer HM, Gutzkow K, Coen M, Van den Hazel PJ, Nieuwenhuijsen M, Vrijheid M:** *The Human Early Life Exposome project (HELIX): The chemical exposome of pregnant women and their children in Europe*

**Ueno D, Koyano S, Kajiwara N, Yamamoto T:** *Contamination status of POPs as wood preservatives in recycled products of waste woods in Japan*

**Vijgen J, de Borst B, Weber R:** *HCH-waste generated by Lindane production - EU cases and strategies how to solve a 40-70 years old POPs Legacy*

**Weidlich T:** *Alternative method for decontamination of solid materials contaminated by polychlorinated dibenzodioxins/dibenzofurans*

**Wyrzykowska-Ceradini B, Oudejans L, Tabor D, Starr J, Mysz A, Stout II DM, Snyder E, Lemieux P, Nardin J, Morris E:** *Development of liquid-based decontamination methods of indoor surfaces after simulated misuse of common pesticides*

**Yeung LWY, van Hees P, Karlsson P, Söderlund L, Filipovic M:** *Total fluorine, extractable organofluorine, per/polyfluoroalkyl substances and total oxidizable precursor assay on contaminated soil*

## DIOXINS AND OTHER POPs IN VIETNAM AND HUMANS AFTER AGENT ORANGE (S 16)

**Hai Le LT:** *Setting national regulatory for POPs/dioxin in soil based on human health risk approach*

**Kido T, Oanh NTP, Honma S, Oyama Y, Anh LT, Phuc HD, Nakagawa H, Nakayama SF, Nhu DD, Tung DV, Minh NH, Toan NV:** *Steroid hormones disruption in 5-year-old children in two dioxin hotspot areas in Vietnam*

**Minh NH, Hue NTM, Thuong NV, Mai PTN:** *Site-specific bioaccumulation of polychlorinated dibenzo-p-dioxins and polychlorinated dibenzofurans (PCDD/PCDFs) in mothers and their infants living in vicinity of Bien Hoa Airbase, Southern Vietnam*

**Nam VD, Trung NQ, Hung NX, Xuyen NT, Thuy LM, Giang LT:** *Preliminary investigation of levels of polychlorodibenzo-p-dioxins and polychlorodibenzofurans in fresh cow milk samples in Hanoi, Vietnam*

**Nishijo M, Pham NT, Pham TT, Tran NN, Le VQ, Tran HA, Phan HAV, Nishino Y, Nishijo H:** *Perinatal dioxin exposure and neurodevelopment of 2-year-old Vietnamese toddlers in the largest hot spot of Agent Orange contamination in Vietnam*

**Pham TT, Nishijo M, Pham NT, Tran NN, Hoang Van T, Hoang Van L, Tran HA, Nishijo H:** *Effects of perinatal dioxin exposure on learning ability of Vietnamese 8-9 years old children*

**Pham NT, Nishijo M, Pham TT, Nghi TN, Quan LV, Anh TH, Anh Vu PhV, Nishino Y, Nishijo H:** *Effects of dioxin exposure on gaze behaviour in 3-year-old children in Vietnam*

**Schechter A, Kincaid J, Lu H, Birnbaum L:** *Serum levels of dioxins, furans, PCBs, and dioxin toxic equivalents (TEQs) in Vietnamese female electronic waste recyclers compared to Vietnamese non-recyclers*

**Wannomai T, Matsukami H, Uchida N, Takahashi F, Le HT, Pham HV, Takahashi S, Kunisue T, Suzuki G:** *Bioaccessible flame retardants in dusts from e-waste-processing workshops in northern Vietnam*

## ECOTOXICOLOGY AND ENVIRONMENTAL TOXICOLOGY OF POPs (S 17)

**Aznar-Alemany Ò, Sala B, Plön S, Bouwman H, Barceló D, Eljarrat E:** *Halogenated and organophosphorus flame retardants in cetaceans from the Indian Ocean*

**de Wit CA, Johansson AK, Sellström U, Lindberg P:** *Input – output study of brominated flame retardants in female captive peregrine falcons*

**Coronado-Posada N, Maza-Villegas J, Olivero Verbel J:** *Rodenticides are potential modulators of human DNA Methyltransferases*

**Eljarrat E, Aznar-Alemany Ò, Sala B, Frías Ó, Barceló D, Blanco G:** *Halogenated flame retardants in birds from central Spain: PBDE levels still very high*

**Gworek B, Kijeńska M, Wrzosek J, Tokarz L, Graniewska M, Stępień W:** *Incorporation of carbamazepine to the biological cycle – red beets as bioindicators*

**Huang WX, Tsai PC, Ngo TH, Wu CP, Ueng YF, Chi KH:** *Assessing the cytotoxicity and genotoxicity of chemical components in fine particulate matters (PM<sub>2.5</sub>) from different areas in Taiwan*

**Jeong Y, Gu B-N, Park G-J, An Y-R, Moon H-B:** *Assessment of prenatal exposure to POPs during second trimester using mother-fetus pairs of finless porpoises (Neophocaena asiaeorientalis)*

**Jepson PD, Deaville R, Barber JL, Brownlow A, Law RJ:** *High extinction risk: severe PCB pollution in European killer whales (Orcinus orca)*

**Kijeńska M, Gworek B, Wrzosek J, Tokarz L, Graniewska M, Stępień W:** *Sewage sludge as a source of dioxins in the biological chain*

**Manhães BMR, Santos-Neto EB, Vidal LG, Bisi TL, Azevedo AF, Lailson-Brito J:** *High organochlorine concentrations in a threatened Guiana dolphin population*



**Muñoz-Arnanz J, Bartalini A, Capanni F, Marsili L, Fossi MC, Jiménez B:** *Assessment of dl-PCBs, PCDD/Fs and PBDEs in striped dolphins and sperm whales from the Mediterranean Sea*

**Ortuño N, Iñiguez ME, Soler A, Moltó J, Conesa JA:** *Sorption of PAHs and other organic pollutants to plastics present in marine debris*

**Pozo K, Gomez V, Torres M, Audy O, Martinik J, Karaskova P, Pribylova P, Klánová J:** *Persistent organic pollutants (POPs) in the marine food web from Central Chile*

**Shi GH, Dai JY:** *Parental exposure to 6:2 chlorinated polyfluorinated ether sulfonate (F-53B) impairs transgenerational reproductive capability in zebrafish*

**Tongue ADW, Drage DS, Harrad S, Reynolds SJ, Fernie KJ:** *Feeling the Heat: Gulls as bioindicators of flame retardant emissions from UK landfill*

**Yoshinouchi Y, Hirano M, Nakata H, Nomiya K, Tanabe S, Kim EY, Iwata H:** *In vitro and in silico approaches for assessing the activation of Baikal seal estrogen receptors by bisphenols and OH-PCBs*

### EMISSION, CONTROL AND CLEANUP (S 18)

**Ajay SV, Kirankumar PS, Sanath K, Prathish KP, Ajit H:** *First study on the determination of emission factors of dioxins from the open burning of municipal solid waste in India*

**Aleksandryan AV, Khachatryan AV:** *Dioxins/furans emissions from different source categories: Biomass burning and forest fires*

**Aleksandryan AV, Khachatryan AV, Kočan A, Šebková K:** *Results of analyses for PCDDs/PCDFs emissions at open burning*

**Andersson S:** *Sulfur recirculation for reducing dioxin formation in waste-to-energy plants*

**Arkenbout A, Olie K, Esbensen KH:** *Emission regimes of POPs of a Dutch incinerator: regulated, measured and hidden issues*

**Du C, Tang M, Lu S:** *Ball milling prepared  $V_2O_5/TiO_2$  catalysts for the catalytic decomposition of 1,2-DCBz*

**Hsu Y-Ch, Chang S-H, Chang M-B:** *Removal of trichlorethylene from water with  $LaFeO_3$  as photocatalyst*

**Konieczny T, Komosiński B, Bobik B, Czaplicka M:** *Concentration of PCDD/F in ambient air in the immediate vicinity of the sewer sludge incineration plant and the biogas-fired combined heat and power plant*

**Kuo Ch-H, Trinh M-H, Chang M-B:** *Characterization of PCDD/Fs and dl-PCBs emission from combustion of PCB-containing oil in a fluidized bed incinerator*

**Moreno Caballero AI, Font R, Conesa JA, Gómez-Rico MF:** *Inhibition effect of polyurethane waste in PCDD/F formation*

**Peng Z, Sun Y, Yan D, Karstensen KH:** *PCDD/Fs, dl-PCBs, chlorobenzenes emission from cement kiln stack using refuse derived fuel generated from municipal solid waste*

**Soler A, Iñiguez ME, Ortuño N, Conesa JA:** *Pollutant emission during pyrolysis of e-waste dechlorinated in subcritical water*

**Yoon YS, Kwon EH, Bae JS, Jeon TW, Lee YK:** *Analysis of dioxins emission characteristic during thermal treatment of chlorinated flame retardant and organochlorine pesticides*

**Yoon YS, Kwon EH, Bae JS, Jeon TW, Lee YK:** *Analysis of dioxins emission characteristic during thermal treatment of hexachlorobutadiene*

**ENDOCRINE DISRUPTION: BIOCHEMICAL AND MOLECULAR MECHANISMS (S 19)**

- Arizono K, Uchida M, Fukushima S, Ishibashi H, Tominaga N:** *Nanosecond pulsed electric field incorporation technique to predict teratogenicity and toxicity of equine estrogens on medaka embryos*
- Boonen I, Vandermarken T, De Nys S, Vervliet P, Covaci A, van Landuyt K, Denison MS, Elskens M:** *Estrogenic activity of monomers and initiators used in resin based dental composites*
- Budinsky B, Passage J, Sriram S, Aylward L, Johnson K:** *TCDD and TCDF effects on fetal rat pituitary and testicular hormone pathways*
- Chenyang J, Meirong Z:** *Estrogen disrupting effect and ecological risk assessment of PHCZs by multi-model*
- Denison MS:** *In vitro and cell-based bioassays for the detection and characterization of activators and inhibitors of estrogen receptor  $\alpha$  and  $\beta$  signaling*
- Hoffmann M, Gogola J, Ptak A:** *GPR30 mediates the effect of tetrabromobisphenol A, but not tetrachlorobisphenol A on ovarian cancer cell proliferation*
- Hsu PC, Guo YL, Chiang HC, Zhong JY, Pan JJ:** *Transgenerational effects of Di-(2-ethylhexyl) phthalate (DEHP) on sperm DNA methylation in rats*
- Kajta M, Wnuk A, Rzemieniec J, Wójtowicz AK:** *Triclocarban induces AHR- and CAR-mediated apoptosis in mammalian neurons*
- Kubota A, Wakayama Y, Lee JS, Nakamura M, Kawai Y, Yoshinouchi Y, Iwata H, Hirano M, Nakata H:** *Evaluating estrogenic and anti-estrogenic potency of bisphenol A analogues in vivo and in silico using zebrafish*
- Liang Y, Zhou Z, Cao H, Zhang W, Wang L:** *The respiratory toxicity and anti-estrogenic effect of tris (2, 3-dibromopropyl) isocyanurate*
- Schilte CFM, Bos AF, Sauer PJJ, Berghuis SA:** *The effects of prenatal persistent organic pollutant exposure on behavioural problems in puberty*

**ENDOCRINE DISRUPTION: TYROIDOGENICITY, EXPOSURE AND HEALTH (S 20)**

- Andersson PL, Zhang J, Li Y, Nam K, Grundström C, Iakovleva I, Brännström K, Olofsson A, Sauer-Eriksson E:** *Identification of potential thyroid hormone disrupting chemicals*
- Goodrum PE, Budinsky RA, Mendelsohn E, Summers H:** *Use of thyroid disease incidence and dose-response analysis to reduce uncertainty in the dioxin oral reference dose*
- Kato Y, Tamaki S, Haraguchi K, Fujii Y, Kimura O, Ohta C, Endo T, Koga N, Degawa M:** *Involvement of transthyretin to Kanechlor-500-mediated changes in serum and hepatic thyroxine levels in mice*
- Liu X, Zhang L, Li J-G, Zhao Y-F, Wu Y-N:** *Serum levels of POPs in early pregnancy and risk of gestational diabetes mellitus*
- Pang S, Wang F, Li A, Gao Y, Liang Y, Song M:** *Tetrabromobisphenol A interferes the onset of blood circulating in zebrafish embryo through disrupting thyroid hormone signal*
- Ruis MT, Rock K, Hall SM, Horman B, Patisaul HB, Stapleton HM:** *Tissue-Specific Accumulation of PBDEs in Placental Tissues and Effects on Thyroid Hormone Regulation*
- Shi Z, Chen T, Tian L, Huang P, Li J:** *Elevated serum decabrominated diphenyl ethers (BDE-209) and alteration of thyroid hormones in workers from a deca-BDE manufacturing plant*
- Wada H, Qi V:** *Effects of Decabromodiphenyl Ether (BDE-209) on ultrasonic communication in mating behavior of rats*

**ENDOCRINE DISRUPTION: MULTI-MODELS, MIXTURES, AND TRANSLATION (S 21)**

**Doan TQ, Muller M, Berntsen HF, Zimmer KE, Verhaegen S, Ropstad E, Connolly L, Scippo ML:** *A realistic mixture of Persistent Organic Pollutants (POPs) reveals possible synergism to inhibit the transactivation activity of the aryl hydrocarbon receptor (AhR) in vitro*

**Leijs ML, Esser A, Schettgen T, Fietkau K, Merk HF, Koppe J, Kraus T, Baron JM:** *Effects of persistent organic compounds on the skin; filtering out effects of exposure to multiple congeners and compounds*

**Koetsier J, Leijs M, van de Sluis K, Koppe J:** *Acetaminophen toxicity in the human fetus*

**Muir T, Michalek JE, Palmer R:** *Integrating exposure, toxicology and epidemiology: a prototype for multi-model, translation, and mixtures study – An update on sample size and lipid-wet weight contrasts*

**Stec AA:** *Occupational exposure to polycyclic aromatic hydrocarbons and elevated cancer incidence in firefighters*

**ENVIRONMENTALLY PERSISTENT FREE RADICALS (S 22)**

**Al-Nu'airat J, Dlugogorski BZ, Gao X, Altarawneh M:** *Formation of environmentally persistent free radicals induced by iron oxide nanoparticles*

**Assaf NW, Altarawneh M, Radny M, Dlugogorski BZ:** *Formation of phenoxy-type EPFR over hydrated pure alumina and Si-doped alumina surfaces*

**Chen T, Lin X, Wang T, Zhan M, Li X:** *Effects of temperature, atmosphere and metal catalysts on the formation of PCDD/Fs and EPFRs from 1,2,3-trichlorobenzene*

**Harmon A, Noel A, Subramanian B, Jennings M, Chen Y, Penn A, Varner K, Dugas T:** *Exposure to environmentally persistent free radicals leads to decreased vascular responsiveness prior to deficits in pulmonary function*

**Liu GR, Yang LL, Zheng MH:** *Effects of metal oxides on environmentally persistent free radical formation and transformation*

**Lomnicki S, Hassan F, Bruce-Keller A, Guo ChQ:** *PM air pollution – are EPFRs (Environmentally Persistent Free Radicals) a marker of PM's health impacts?*

**Vejerano EP, Mamun M, Ahn JH:** *Research trajectory for environmentally persistent free radicals*

**EPIDEMIOLOGY (S 23)**

**Berghuis SA, Bos AF, Sauer PJJ, Bocca G:** *Prenatal exposure to persistent organic pollutants and anthropometric measures in adolescents*

**Drobná B, Fabišíková A, Čonka K, Gago F, Oravcová P, Wimmerová S, Šovčíková E:** *PBDE serum concentration and pre-school maturity of children from Slovakia*

**Haga Y, Suzuki M, Matsumura C, Okuno T, Tsurukawa M, Fujimori K, Kannan N, Weber R, Nakano T:** *Monitoring of OH-PCBs in PCB transport worker's urine for a non-invasive exposure assessment tool*

**Lazar F, Bacher S, Göen T, Stiegler H, Hölzer J:** *LDL-Cholesterol in PFOA-exposed residents from Arnsberg, Germany – results of a cohort study 2006-2017*

**Long M, Wielsøe M, Ghisari M, Bech BH, Henriksen TB, Olsen J, Bonefeld-Jørgensen EC:** *Dioxin-like POPs induced aryl hydrocarbon receptor transactivity in the Danish pregnant women and fetal growth outcomes*

**Schilte CFM, Bos AF, Sauer PJJ, Berghuis SA:** *The effects of prenatal persistent organic pollutant exposure on behavioural problems in puberty is also in BiochemToxicol*

**Webster TF, Oken E, Harris M, Mora AM, Preston E, Fleisch A, Rifas-Shiman S, Sagiv SK:** *Exposure to PFAS and childhood development: Studies from project Viva*

**Webster TF, Weisskopf MG:** *Biomarkers of exposure to persistent organic pollutants: Blessing and curse for epidemiology?*



## EXPOSURE – FOOD CHAIN, MATERNAL, INDOOR, OCCUPATIONAL AND ACCIDENTAL (S 24)

**Abafe OA, Martincigh BS:** *Cumulative human exposure to a cocktail of organohalogenated flame retardants in the indoor environment*

**Bastiaensen M, Ait Bamai Y, Araki A, Van den Eede N, Kishi R, Covaci A:** *Determinants of exposure to phosphate flame retardants for Japanese schoolchildren*

**Been F, Bastiaensen M, Malarvannan G, Yin S, Yao Y, Schepens T, Jorens Ph, Covaci A:** *Exposure to phosphorous flame retardants (PFRS) and alternative plasticizers in intensive care patients*

**Christia C, Poma G, Covaci A:** *Brominated and organophosphorus flame retardants in indoor dust from Belgium: Exposure assessment via non-dietary pathways*

**Christia C, Poma G, Harrad S, de Wit C, Leonards PEG, Lamoree M, Covaci A:** *Occurrence of legacy and current-use plasticizers in indoor dust from various EU countries*

**Coggins M, Wemken N, Drage DS, Cellarious C, Cleere K, Morrison J, Daly S, Abdallah M, Tlustos C, Harrad S:** *Brominated flame retardants (BFRs) in human breast milk collected from first time Irish mothers, 2016 – 2018 – ELEVATE*

**Fromme H, Albrecht M, Janitzki N, Wollin KM, Aschenbrenner B:** *Occurrence of chlorinated and brominated dioxins/furans (PBDD/Fs, PBBDFs), and polychlorinated biphenyls (PCBs) in German breast milk (LUPE 8)*

**Imamura M, Takatsuki S, Tsutsumi T, Maeda T, Akiyama H:** *Estimated dioxin intakes from commercial baby foods in Japan*

**Kademoglou K, Giovanoulis G, Palm-Cousins A, Padilla-Sanchez JA, Magnér J, de Wit CA, Collins ChD:** *Sniffing out the plastic: inhalation bioaccessibility of phthalate esters and alternative plasticizers present in indoor dust using simulated lung fluids*

**Li L, Qiu Y, Weiss J, Gustafsson Å, Thomas L, Kraus MA, Bergman Å:** *Physical and chemical characterization of a respirable dust fraction from residential houses in Shanghai, China*

**Lignell S, Aune M, Cantillana T, Darnerud PO, Fridén U, Glynn A:** *Dioxins and PCBs in a Swedish food market basket study - dietary intake estimations and temporal trends*

**Nakao T, Kakutani H, Yuzuriha T, Ohta S:** *Contamination level of organo phosphorus flame retardants (OPFRs) in human breast milk of Japan*

**Pruvost--Couvreur M, Desvignes V, Roudot AC, Rivière G and the Contalait Study group:** *Assessment of the impact of breastfeeding duration on PCBs and PCDD/Fs body burdens using PBPK modeling*

**Pruvost--Couvreur M, Rivière G, Le Bizec B, Béchaux C:** *Development of a statistical method to assess the dietary lifetime exposure to PCBs from punctual measurements*

**Richterová D, Fábelová L, Patayová H, Pulkrabová J, Rausová K, Šovčíková E, Štencel J, Hajšlová J, Trnovec T, Palkovičová Murínová L:** *Determinants of prenatal exposure to perfluoroalkyl substances in the Slovak birth cohort*

**Shindo M, Terao K, Muramatsu K, Tokumura M, Wang Q, Miyake Y, Amagai T, Makino M:** *Estimating potential dermal exposure to organophosphorus flame retardants via direct contact with products*

**Takekuma M, Hayashi M, Kim H, Osawa H:** *A survey of indoor air chemical contaminants in newly built detached houses*

**Tian L, Huang P, Li P, Shi Z:** *Brominated flame retardants in indoor dust from Beijing, China - contamination level, human exposure and evidence for PBDEs replacement*

**Tokumura M, Muramatsu K, Wang Q, Miyake Y, Amagai T, Makino M:** *Comparison of rates of direct and indirect migration of phosphorus flame retardants from flame-retardant-treated polyester curtains to indoor dust*

**Warenik-Bany M, Struciński P, Piskorska-Pleszczyńska J:** *Exposure to dioxins and dl-PCB as a result of venison consumption*

**Wemken N, Drage DS, Abdallah M, Harrad S, Coggins M:** *An assessment of the exposure of the Irish population to selected brominated flame retardants via indoor air and dust*

**Yin SS, Liu WP:** *Enantiomeric fractions of chiral OCPs in trans-placental transfer*

**Zhu Q, Liao Ch:** *Phthalate esters in indoor dust from several regions, China and its implication for human exposure*

**Zieliński M, Grešner P, Ligocka D, Polańska K, Gromadzińska J, Hanke W, Wąsowicz W:** *Environmental exposure to persistent organic pollutants and markers of oxidative stress in women during pregnancy and lactation*

#### EXPOSURE – POPs IN PETS AND THEIR APPLICABILITY AS MODELS FOR HUMAN HEALTH (S 25)

**Brits M, Rohwer ER, De Vos J, Weiss JM, Brandsma SH, de Boer J:** *Analysis of brominated and organophosphorus flame retardants and chlorinated paraffins in South African indoor dust and cat hair*

**Kannan K, Karthikraj R, Borkar S, Lee S:** *Parabens and melamine in pet urine from New York State, United States*

**Khidkhan K, Mizukawa H, Ikenaka T, Nakayama S, Darwish WS, Nomiya K, Takiguchi M, Yokoyama N, Ichii O, Tanabe S, Ishizuka M:** *Tissue distribution and CYP expression related-PCBs exposure in cats*

**Mizukawa H, Khidkhan K, Ikenaka Y, Nakayama SMM, Nomiya K, Yokoyama N, Ichii O, Takiguchi M, Tsend-ayush S, Tanabe S, Ishizuka M:** *Effects of polychlorinated biphenyls (PCBs) in cats: Exhaustive gene expression analysis approach*

**Nomiya K, Eguchi A, Mizukawa H, Yamamoto Y, Nishikawa H, Takiguchi M, Nakayama S, Ikenaka Y, Ishizuka M, Tanabe S:** *Pilot study on the toxicological assessment of organohalogen compounds in pet cat (*Felis catus*) serum using metabolomics approach*

**Shimasaki M, Nomiya K, Mizukawa H, Saengtienchai A, Ngamchirttakul A, Pencharee D, Ikenaka Y, Nakayama S, Kunisue T, Tanabe S:** *Contamination status and global comparison of organohalogen compounds and their related compounds in the pet cats in Thailand*

**Weiss J, Andersson P, Hamers T, Legradi J, Lamoree M, Jones B, Bignert A, Carlsson G, Bergman Å:** *Cats exposure to organic contaminants and potential effects on the thyroid hormone system*

**Tamura S, Agusa T, Hirano M, Eguchi A, Nomiya K, Li L, Kannan K, Tanabe S, Kim EY, Iwata H:** *PCBs as an environmental obesogen in dogs: evidence from hepatic transcriptome, metabolome, and lipidome analyses*

#### FATE AND BEHAVIOR OF VOLATILE METHYLSILOXANES IN THE ENVIRONMENT (S 26)

**Dumanoglu Y, Yaman B, Odabasi M:** *Seasonal variations of cyclic and linear volatile methylsiloxanes in an urban atmosphere*

**Durham J, McNett DA, Boehmer T, Kozerski GE, Xu S:** *Identification and reduction of analytical bias for analysis of silicon containing materials*

**Homem V, Capela D, Espregueira C, Ratola N:** *Screening of volatile methylsiloxanes in sand from Portuguese beaches*

**Horii Y, Minomo K, Ohtsuka N, Motegi M, Takemine S, Hara M:** *Regional characteristics and annual and diurnal variations of methylsiloxanes in the atmospheric environment, Saitama, Japan*

**Horii Y, Taniyasu S, Yamazaki E, Falandysz J, Yamashita N:** *Volatile methylsiloxanes as important alternatives to PFASs*

**Kim J, Mackay D, Whelan MJ:** *Dynamic behaviors of linear and cyclic volatile methylsiloxanes in global and local environments*

**Ratola N, Homem V, Rocha F, Capela D, Silva JA, Ramos S, Jiménez-Guerrero P, Castro-Jiménez J, Alves A:** *Assessing volatile methylsiloxanes in coastal areas*

**Warner NA, Nikiforov V, Krogseth IS, Kierkegaard A, Bohlin-Nizzetto P:** *Reducing sampling artifacts in air measurements: Improvement of active air sampling methodologies for accurate measurements of cyclic volatile methylsiloxanes in remote regions*

**Xu S, Miller J, Annette Vogel A:** *Modeling assessment and experimental measurements of snow scavenging of octamethylcyclotetrasiloxane (D4) and decamethylcyclopentasiloxane (D5)*

#### HALOGENATED PAHs AND PAHs (S 27)

**Asakawa D, Tojo T, Ichihara M, Matsumura C, Hasegawa H, Miyawaki T, Nishino T:** *Development of LC-DA-APPI-MS/MS method for determination of nitrated polycyclic aromatic hydrocarbons and its diurnal variations during transboundary air pollution events*

**Haga Y, Yoshiki R, Matsumura C, Yamasaki T, Nakagoshi A, Fujimori K, Tojo T, Hasegawa H, Miyawaki T, Nishino T, Nakano T:** *Spatial distribution and risk assessment of polycyclic aromatic hydrocarbons (PAHs) in sediments in Hyogo Prefecture, Japan*

**Huo Ch-Y, Sun Y, Liu L-Y, Wen-Long Li, Ed Sverko, Hai-Ling Li, Zhang Z-F, Ma W-L, Song W-W, Yi-Fan Li:** *Centered accumulation and equilibrium of PAHs on indoor window films and the influence of central heating*

**Liu GR, Jin R, Zheng M, Yang L, Xu Y, Li C:** *Field investigation on the releases of halogenated polycyclic aromatic hydrocarbons from cement kilns with sewage sludge co-processed*

**Lyu J-M, Chi K-H, Chang M-B:** *Characteristics of PM<sub>2.5</sub> and polycyclic aromatic hydrocarbons emitted from coal combustion processes*

**Masuda M, Wang Q, Tokumura M, Miyake Y, Amagai T:** *Unintentional generation of chlorinated polycyclic aromatic hydrocarbons during cooking*

**Matsumura C, Haga Y, Yoshiki R, Nakatsubo R, Kon G, Okamura H, Dan T, Tojo T, Hasegawa H, Miyawaki T, Nishino T, Nakano T:** *Analysis of organic pollutants contained in soot from marine diesel engines*

**Muenster H, Tirler W:** *GC-APPI of PAH on an orbitrap compared to EI on a high resolution sector field system*

**Nežiková B, Degrendele C, Čupr P, Hohenblum Phi, Moche W, Prokeš R, Vaňková L, Kukučka P, Martiník J, Audy O, Příbylová P, Holoubek I, Weiss P, Klánová J, Lammel G:** *Bulk atmospheric deposition of persistent organic pollutants and PAHs in Central Europe*

**Ngo TH, Yang HY, Pan SY, Hsu WT, Hung PC, Chou CCK, Wu CP, Chi KH:** *Polycyclic aromatic hydrocarbons emission in stack gases and source apportionment in Taiwan atmosphere*

**Sei K, Wang Q, Masuda M, Tokumura M, Miyake Y, Amagai T:** *An analytical method for chlorinated polycyclic aromatic hydrocarbons in particles by thermal desorption-GC/MS*

**Szternfeld Ph, Marchi J, Chao S, Broos J, Joly L:** *Modular method for polycyclic aromatic hydrocarbons determination in spices and dried herbs by GC-MS/MS*

**Urbancova K, Lankova D, Sram RJ, Hajslova J, Pulkrabova J:** *Comparison of monohydroxylated metabolites of polycyclic aromatic hydrocarbon concentrations in urine samples collected from mothers and their newborns living in two localities of the Czech Republic*

**Wu G, Sun Y, Jiang Ch, Lu Y:** *Research on pollution prevention and control BAT of chlorinated aromatics in secondary copper industry*

**Xiu M, Wang X, Mueller J, Beecroft A, Morawska L, Thai KPh:** *Emission of particulate matter, VOCs and PAHs from different asphalt mixes*

**Zhe X, Marvin C, Thomas PJ, Johnson W, Francisco O, Idowu I, Stetefeld J, Crimmins B, Tomy GT:** *Identification of halogenated polycyclic aromatic compounds in biological samples from Alberta oil-sands region*

#### **LEGACY AND EMERGING FLAME RETARDANTS : ENVIRONMENTAL LEVELS AND HUMAN EXPOSURE (S 28)**

**Abdel Malak IA, Cariou R, Dervilly-Pinel G, Jaber F, Le Bizec B:** *Dechlorane related compounds dietary exposure in the Lebanese population*

**Chessa G, Cossu M, Ledda G, Piras P, Fiori G, Sanna A, Marrosu R, Brambilla G:** *Occurrence of hexabromocyclododecanes (HBCDDs) in seafood from the Sardinia Sea - FAO 3.1.3 area and its impact on human health within the Marine Framework Strategy Directive*

**Dreyer A, Neugebauer F, Rüdell H, Paulus M, Lohmann N, Rauert C, Koschorreck J:** *Halogenated flame retardants in biota samples from the German North- and Baltic Sea*

**Ganci AP, Vane CH, Abdallah MA, Moehring T, Harrad S:** *Legacy PBDEs and NBFRs in surficial sediments of the River Thames, UK*

**Genisoglu M, Sofuoglu A, Kurt-Karakus PB, Birgul, A, Sofuoglu SC:** *Alternative (novel) brominated flame retardants in PM1, PM10 and settled dust in a computer technical service*

**Gys C, Kovačič A, Huber C, Oh J, Ahn YA, Kim S, Lai FY, Heath E, Covaci A:** *Screening of in vitro and in vivo metabolites of bisphenol S by liquid chromatography coupled to quadrupole time-of-flight mass spectrometry*

**Kannan K, Kim U-J:** *Occurrence and distribution of organophosphate flame retardants in surface waters, tap water, and rainwater from New York State, USA*

**Kim H-J, Lee Ch-H, Kim D-H, Oh J-E, Kim Ch-G:** *Study on distributional characteristics of brominated flame retardants (PBDEs) according to land use of Seoul metropolitan region in Republic of Korea*

**McGrath TJ, Morrison PD, Ball AS, Clarke BO:** *Legacy and novel brominated flame retardants in indoor dust in Melbourne, Australia: An assessment of human exposure*

**Niu D, Qiu Y, Li L, Zhu Z, Yin D, Zhao J, Bergman Å:** *Levels and human exposure of novel brominated flame retardants in floor and elevated surface house dust from Shanghai, China*

**Pietroń W, Pajurek M, Mikołajczyk Sz, Maszewski S, Warenik-Bany M, Piskorska-Pliszczyńska J:** *Exposure to PBDEs associated with farm animal meat consumption*

**Poma G, Liu Y, Cuykx M, Tang Bl, Luo XJ, Covaci A:** *Occurrence of organophosphorus flame retardants (PFRs) in edible and wild insects from China*

**Poma G, Sales C, Bruyland B, Christia C, Gosciny S, van Loco J, Covaci A:** *Can food processing influence the level of contamination with organophosphorus flame retardants and plasticizers (PFRs) in Belgian foodstuffs?*

**Tao F, Sellström U, de Wit CA:** *Organohalogenated and organophosphorus flame retardants in office air and dust in Sweden*

**Qiu Y, Li L, Niu D, Zhu Z, Huang Q, Yin D, Zhao J, Bergman Å:** *Size distribution of organophosphate flame retardants in settled house dust from Shanghai, China*

**Xu PJ, Zhang T, Li N, Ren Y, Zhou ZG, Qi L, Liu AM, Huang YR:** *PBDD/Fs concentrations and distributions in farmland soil of Guiyu, China*

**Yaman B, Dumanoglu Y, Odabasi M:** *Atmospheric concentrations and gas – particle partitioning of organophosphate flame retardants in Izmir, Turkey*

**Yang W, Zhu Ch, Xu P, Du B, Dong L, Huang Y:** *Levels and distribution of hexabromocyclododecanes in surface waters and sediments from Mihe basin of Shandong Province, China*

**Yasutake D, Sato T, Hori T, Watanabe T:** *Estimation of dietary intake of Dechlorane Plus and related compounds in a Japanese National Survey*

**Yui K, Motoki T, Kato H, Kajiwara N, Kuramochi H, Sakai S, Wania F:** *Measurement of vapor pressures of some selected polybrominated aromatic flame retardants and evaluation of vapor pressure estimation models*

**Zhou L, Püttmann W:** *Occurrence and distribution of organophosphate flame retardants (OPFRs) in indoor dust from shops, homes and offices of the Rhine/Main region, Germany*

#### LEGACY AND EMERGING FLAME RETARDANTS : METABOLISM AND TOXICOKINETICS (S 29)

**Abdallah MA, Nguyen KH, Harrad S:** *First insight into human extrahepatic metabolism of flame retardants: Biotransformation of EH-TBB and Firemaster-550 by human skin subcellular fractions*

**Feng M, Yin H:** *Comparative proteomics reveal the interaction mechanism of co-existed tetrabromobisphenol A (TBBPA) and Cr(VI) with the cells of *Pycnoporus sanguineus**

**Hou X, Liu J, Jiang G:** *Glycosylation of TBBPA in hydroponic exposed pumpkin plants*

**James MO, Cisneros KV, Agarwal V:** *Sulfonation and glucuronidation of hydroxylated bromodiphenyl ethers*

**Malarvannan G, Poma G, Scudder ChJ, Niessen SJM, Covaci A:** *Organohalogenated chemicals and their association with acromegaly in humans*

**Phillips AL, Stapleton HM:** *Inhibition of human liver carboxylesterase by organophosphate flame retardant & plasticizer esters: Implications for pharmacotherapy*

**Wan WN, Huang HL, Han RX, Zhang SZ:** *Uptake, translocation, and biotransformation of organophosphorus esters in wheat (*Triticum aestivum* L.)*

**Wei Y, Xing X, Kang J, Qiu J, Zhong X:** *Exposure to PBDEs impedes vascular development and alters gene expression related to angiogenesis and barrier function*

#### LEGACY AND EMERGING FLAME RETARDANTS : METABOLISM AND TOXICOKINETICS (S 29)

**Abdallah MA, Nguyen KH, Harrad S:** *First insight into human extrahepatic metabolism of flame retardants: Biotransformation of EH-TBB and Firemaster-550 by human skin subcellular fractions*

**Feng M, Yin H:** *Comparative proteomics reveal the interaction mechanism of co-existed tetrabromobisphenol A (TBBPA) and Cr(VI) with the cells of *Pycnoporus sanguineus**

**Hou X, Liu J, Jiang G:** *Glycosylation of TBBPA in hydroponic exposed pumpkin plants*

**James MO, Cisneros KV, Agarwal V:** *Sulfonation and glucuronidation of hydroxylated bromodiphenyl ethers*

**Malarvannan G, Poma G, Scudder ChJ, Niessen SJM, Covaci A:** *Organohalogenated chemicals and their association with acromegaly in humans*

**Phillips AL, Stapleton HM:** *Inhibition of human liver carboxylesterase by organophosphate flame retardant & plasticizer esters: Implications for pharmacotherapy*

**Wan WN, Huang HL, Han RX, Zhang SZ:** *Uptake, translocation, and biotransformation of organophosphorus esters in wheat (*Triticum aestivum* L.)*

**Wei Y, Xing X, Kang J, Qiu J, Zhong X:** *Exposure to PBDEs impedes vascular development and alters gene expression related to angiogenesis and barrier function*



**LEGACY AND EMERGING FLAME RETARDANTS : IDENTIFICATION, NEW ANALYTICAL METHODS AND APPLICATION (S 30)**

**Brazeau AL, Pena-Abaurrea M, Shen L, Riddell N, Reiner EJ, Lough AJ, McCrindle R, Chittim B:** *Dechlorinated analogues of Dechlorane Plus*

**Chan T-Ch, Yip Y-Ch:** *Determination of hexabromocyclododecane (HBCD) in PUF/filter samples by isotope dilution liquid chromatography– tandem mass spectrometry (LC–MS/MS)*

**Chibwe L, De Silva AO, Myers AL, Reiner EJ, Jobst K, Muir DCG:** *First steps towards characterization of polyhalogenated alkane (PXA) flame retardants*

**Cooper J, Parera J, Abad E, Law R, Cojocariu C:** *Identification and quantification of polybrominated diphenyl ethers (PBDEs) in environmental samples using gas chromatography coupled to orbitrap mass spectrometry*

**Crombie S, Moore S, Proulx S:** *Comparative methods for effective clean-up of flame retardants in sediments*

**Drage DS, Sharkey M, Abdallah MA, Berresheim H, Harrad S:** *Is portable XRF a viable tool for testing compliance of waste articles with low POP concentration limits?*

**Haraguchi K, Fujii Y, Ohta C, Koga N, Kimura O, Endo T, Kato Y:** *Human exposure to brominated phenoxy phenols: seaweeds as source of hydroxylated and methoxylated PBDEs in Asia-Pacific*

**Huang P, Li J, Shi Z, Tian L:** *Analysis of polybrominated diphenyl ethers and novel brominated flame retardants in human serum by QuEChERS pretreatment coupled to GC-APCI-MS/MS*

**Kubwabo C, Fan X, Katuri GP, Rasmussen PE:** *Determination of aryl and alkyl-aryl phosphates in house dust*

**Matsukami H, Suzuki G:** *In silico screening for bioaccumulative and bioavailable constituents in chlorinated organophosphorus oligomer flame retardant known as V6*

**McGrath TJ, Morrison PD, Ball AS, Clarke BO:** *Are Australian electronic waste recycling facilities contaminating surrounding soils with brominated flame retardants?*

**Miyake Y, Tokumura M, Wang Q, Amagai T, Ogo S, Kume K, Kobayashi T, Takasu S, Ogawa K, Kannan K:** *Identification of novel phosphorus flame retardants in curtains using orbitrap mass spectrometry*

**Oluseyi T, Harrad S, Abdallah M, Calaprice Ch:** *Correlation of XRF measurements of chlorine with GCMS analysis of chlorinated organophosphate flame retardants in wastes*

**Puype F:** *Identification of “heavy” and polymeric brominated flame retardants in polymeric consumer goods by reactive and non-reactive pyrolysis GC-MS: approach for primary identification*

**Ramungul N, Methacanon P, Songngam S, Jongthammanurak S, Boontongkong Y, Srikudvien P:** *A preliminary study of flame retardants in WEEE plastics in Thailand*

**Sharkey M, Drage D S, Abdallah M A-E, Harrad S, Berresheim H:** *Suitability of portable x-ray fluorescence for the quantification of brominated flame retardants in waste – A large scale study in Ireland*

**Wang S, Romanak K, Salamova A, Stubbings WA, Hendryx M, Arrandale VH, Diamond ML, Venier M:** *Validation of silicone wristbands as passive samplers for the assessment of exposure to flame retardants and polycyclic aromatic hydrocarbons*

**Zacs D, Perkons I, Bartkevics V:** *Applicability of gas chromatography coupled with atmospheric pressure chemical ionization Fourier transform ion cyclotron resonance mass spectrometry (GC-APCI-FTICR-MS) for the analysis of flame retardants in food*

## LEVELS IN HUMAN FOODS AND ANIMAL FEEDS (S 31)

**Brambilla G, Ceci R, Abete MC, Binato G, Chessa G, Esposito M, Fedrizzi G, Ferrantelli V, Ferretti E, Menotta S, Miniero R, Nardelli V, Neri B, Piersanti A, Scortichini G, Ubaldi A, Diletti G:** *Suitability of  $\Sigma 6$  ndl-PCB dataset from official food monitoring plans 2013-15 for dietary intake estimates in the Italian population*

**Bremnes NMB, Thomsen C, Haug LS:** *The Norwegian POPs in food-study: A Worldwide Interlaboratory Study*

**Díaz-Ferrero J, Riba M, Moral A, Martí R:** *Levels of persistent organic pollutants (PCDD/Fs, PCBs, PBDEs and Dechloranes) in paprika*

**Glushkina DM, Bulik S, Numata J, Schafft H, Lahrssen-Wiederholt M:** *Extending the 3R principle using PBPK modelling: A case study of TCDD transfer from feed to growing pigs*

**Han Y, Liu W:** *Sources of polychlorinated dibenzo-p-dioxins and dibenzofurans, and biphenyls in Chinese mitten crabs*

**Hope K, Fiedler H, Pond P, Hope D:** *Polychlorinated biphenyls in major foodstuffs on the Canadian market*

**Kirankumar PS, Sanath K, Ajay SV, Prathish KP, Ajit H:** *Quantification of dioxins and dioxin-like PCB levels in fish samples collected from Periyar River, India*

**Law R, Calaprice C, Silcock P, Cojocariu C:** *Applying EU LOQ guidance for the low level quantification of PCDD/Fs in animal feed using a triple quadrupole GC-MS/MS system with an advanced EI source*

**Malisch R, Kraetschmer K, Schill S, Tschiggfrei K, Zwickel T, Schaechtele A:** *EU Reference Laboratory and National Reference Laboratories for halogenated POPs in feed and food*

**Małagocki P, Furga B, Gembal M, Cebulska J, Milczarczyk E, Piskorska-Pliszczynska J:** *Results of official control of dioxins and dl-PCBs in Polish feedstuffs*

**Maszewski S, Mikołajczyk S, Pajurek M, Pietroń W, Warenik-Bany M, Piskorska-Pliszczynska J:** *Dioxin and PCB levels in milk of farm animals*

**Mikołajczyk S, Maszewski S, Pajurek M, Pietroń W, Warenik-Bany M, Piskorska-Pliszczynska J:** *Dioxins and PCBs in ostrich eggs - unknown source of contamination*

**Mukai Y, Goto A, Tashiro Y, Tanabe S, Kunisue T:** *Coastal monitoring of organohalogen compounds using oysters from Okinawa island, Japan*

**Pajurek M, Mikołajczyk Sz, Maszewski S, Piskorska-Pliszczynska J:** *Background levels of dioxins and PCBs in Polish feed materials, 2013 to 2017*

**Pajurek M, Pietroń W, Maszewski S, Mikołajczyk Sz, Piskorska-Pliszczynska J:** *Poultry eggs as a source of PCDD/Fs, PCBs, PBDEs and PBDD/Fs*

**Umnova NV, Turbabina KA, Levenkova ES, Roumak VS, Shelepchikov AA:** *PCDD/Fs in tissues of wild animals inhabiting sites outside the landfill near Moscow, Russia*

**Warenik-Bany M, Pajurek M, Mikołajczyk S, Pietroń W, Piskorska-Pliszczynska J:** *Dioxin and PCB levels comparison in farm and wild deer*

## MECHANISMS OF FORMATION AND DESTRUCTION OF HALOGENATED DIOXINS, PAHs, BIPHENYLS AND SIMILAR COMPOUNDS (S 32)

**Fujimori T, Kojima Y, Takaoka M, Shiota K, Ina T, Niwa Y:** *Formation of chlorinated dioxins by open burning of cables: Reaction between copper and PVC*

**Herrera Mejía SL, Villa Holguín AL, Johnson BG:** *Hydrodechlorination of PCDD/Fs and dl-PCBs over molybdenum supported catalysts*

**Iñiguez ME, Soler A, Ortuño N, Conesa JA:** *Effect of sodium chloride and thiourea in the pollutant formation during combustion of plastics*

**Lu H, Huang L, Li Q, Su G, Zheng M:** *Synthesis of metal oxide nanomaterials for the catalytic degradation of 1-chloronaphthalene and 2-monochlorobiphenyl*

**Moreno Caballero AI, Font R, Conesa JA, Gómez-Rico MF:** *Recent studies of inhibition of PCDD/F formation in thermal processes*

**Solá-Gutiérrez C, San Román MF, Ortiz I:** *Dioxins and furans as by-products in the oxidation of Triclosan*

**Stec AA, Dickens KE:** *The fate of phosphorus flame retardants in fires*

**Xia K, Wang X, Ni Y, Zhang H, Zhang Y, Chen J:** *Precursors of PCDD/Fs during non-wood pulp chlorine bleaching process*

**Yoneda T:** *Chemical degradation of a substituted-chlorobenzene in an aqueous medium using palladium catalysts tethered by a hydrophobic organophosphonic acid*

**Zhang H, Fan Y, Chen J:** *Levels and fingerprints of chlorinated aromatic hydrocarbons in flue gases and fly ashes from the typical industrial thermal processes: Implication for the mechanism of simultaneous formation*

**Zhang M, Fujimori T, Shiota K, Mukai K, Buekens A, Li X, Niwa Y, Takaoka M:** *XAFS investigation of chromium chloride catalysed formation of dioxins*

## NON-TARGET SCREENING – MULTIMEDIA ANALYSIS (S 33)

**Aznar-Alemany Ò, Sala B, Jobst KJ, Reiner EJ, Borrell A, Aguilar À, Barceló D, Eljarrat E:** *Temporal trends of flame retardants and non-targeted analysis of halogenated contaminants in striped dolphins from the Mediterranean Sea*

**Cariou R, Léon A, Hutinet S, Guitton Y, Hurel J, Pourchet-Gellez M, Antignac JP, Munsch C, Tixier C, Dervilly-Pinel G, Le Bizec B:** *HaloSeeker v1.0, a user-friendly software application for screening halogenated chemicals from untargeted high resolution mass spectrometry data*

**Hasegawa H, Nishino T, Tojo T, Matsumura C, Miyawaki T, Suzuki S:** *Screening of organic pollutants in environmental water in urban areas of Japan*

**Hashimoto S, Matsukami H, Ieda T, Suzuki G:** *Comprehensive analysis of halogenated compounds in discharge water samples by GC×GC/ToFMS*

**Kato M, Nishino T, Shimoma S:** *Comprehensive analysis of organic compounds in the water environment in Tokyo by automated identification and quantification system with GC-MS database*

**Lee S, Kim K, Jeon J, Moon H-B:** *Prioritization of emerging contaminants in the Arctic environment using target and non-target screening analysis*

**Li Y, Yu N, Wei S:** *Non-target strategy of organic compounds in paired maternal and cord serum*

**Lin Y, Ruan T, Jiang G:** *Identification of ToxCast chemicals in airborne fine particulate matter by a suspect screening strategy*



**Miyawaki T, Takahashi K, Nishino T, Hasegawa H, Tojo T, Matsumura C:** *Screening method of organic pollutants in river water of urban areas in Japan using a GC-MS database system*

**Qu GB, Liu AF, Qianchi M, Jianbo S, Guibin J:** *Transformation of TBBPA/S derivatives in soil samples*

**Rostkowski P, Haglund P, Oswald P, Thomaidis N, Aalizadeh R, Covaci A, Moschet Ch, Karzenon S, Yang Ch, Shang D, Hindle R, Booi P, Ionas A, Grosse S, Arandes JB, Dévier MH, Lestremau F, Leonards P, Plassman M, Magner J, Matsukami H, Jobst K, Reid M:** *The value of complementary techniques in suspect and non-target screening – results of the Norman Collaborative Trial of the indoor dust*

**Wei S, Yu N:** *Non-target screening of organic pollutants in multimedia in China*

**Yu N, Guo H, Wei S:** *Non-target and suspect screening of per- and polyfluoroalkyl substances in airborne particulate matter in China*

**Yukioka S, Tanaka S, Suzuki Y, Fujii S, Echigo S, Hayashi A:** *Suggestion on a procedure to identify non-targeted per – and polyfluoroalkyl substances (PFASs) based on fragmentation flagging by liquid chromatography-ion mobility-quadrupole-time of flight mass spectrometry (LC/IM-QTOF)*

**Zhang XM, Jobst K, Helm P, Reiner EJ, Brindle I:** *Targeted and non-targeted screening of hydrophobic halogenated compounds in aquatic environment via passive sampling and GC-APCI-QToF-MS analysis: Potential application in water quality surveillance programs*

#### ORGANOMETALLIC CONTAMINANTS (S 34)

**Eklund B:** *Is TBT occurrence on pleasure boats still a problem?*

**Huang Q, Yang L, Zhu Z, Qiu Y, Yin D, Zhao J, Bergman Å:** *Contamination of organotin compounds in public drinking water in Shanghai, China*

**Josefsson S, Apler A, Zillén L, Linderoth M:** *Temporal and spatial trends of organic contaminants in Baltic Sea and Swedish west coast off-shore sediment*

**Kroupová K, Kuta J, Maňoušek J, Adu-Kumi A:** *A fast and sensitive method for determination of methylmercury in human milk and blood using isotopic dilution HPLC-ICP-MS*

**Kuangwei H, Koji A, Yuka Y, Yasuhiro I:** *Analysis and comparison of mercury-containing by-product and estimation of mercury release from the industrial coal-fired boiler NOWY abstract 0598*

**Mędyk M, Dryżałowska A, Wang Y-Z, Zhang J, Falandysz J:** *Effect of deep frying (with a wok pan) on level of mercury in mushrooms*

**Saba M, Wang Y-Z, Zhang J, Falandysz J:** *Mercury contamination levels and distribution in sclerotia of *Wolfiporia cocos* (F.A. Wolf) Ryvarden & Gilb*

**Zhang J, Falandysz J, Wang YZ, Li T:** *Contamination of mushrooms from China with arsenic and arsenic compounds, a mini review*

#### PERSISTENT BIOCIDES AND PESTICIDES (S 35)

**Abbasi NA, Arukwe A, Jaspers VLB, Eulaers I, Mennilo E, Ibor OR, Frantz A, Covaci A, Malik RN:** *Oxidative stress responses in relationship to persistent organic pollutant levels in feathers and blood of two predatory bird species from Pakistan*

**Fujita K, Sakai A, Kondoh Y, Honda K, Osada H, Inui H:** *Reduction of crop contamination resulting from hydrophobic contaminants by the treatment of pesticides targeting to its transport factors*

**Guida YS, Meire RO, Silva EBV, Capella R, Lino AS, Carvalho DFP, Braga ALF, Torres JPM:** *Occurrence of atmospheric legacy and current-use pesticides in two highly impacted areas of Brazilian southeastern coast: How much pesticides can we breathe at sub/urban areas?*

**Lu XB, Fu L, Chen JP:** *Levels, distributions and human health risks of OCPs and PCBs in freshwater products*

**Mierzejewska E, Urbaniak M, Baran A, Tankiewicz M:** *The effect of the selected plant secondary metabolites on structurally related phenoxy herbicides (2,4-D and MCPA) removal rate, presence of bacterial degradative genes and samples phytotoxicity*

**Pelesz A, Wójtowicz AK:** *Triclocarban affects the estradiol secretion and causes both cytotoxic and apoptotic death in human placental choriocarcinoma JEG-3 cells*

**Sajwan KS, Loganathan B, Powell M, Patel B, Rawon C:** *Legacy organochlorine insecticides and biocides in sediments and fish samples from brackish and coastal waters off Savannah, Georgia, USA*

**Tojo T, Ichihara M, Asakawa D, Kakutani N, Miyamoto I, Ueda M, Matsumura C, Hasegawa H, Miyawaki T, Nishino T:** *Development of analytical methods for pesticides in ambient air: Comparison between target analysis and non-target analysis*

**Wang S, Romanak K, Steiniche T, Wasserman M, Venier M:** *Occurrence of legacy pesticides, current use pesticides, and flame retardants in conservation areas*

**Yadav IC, Watanabe H:** *Soil erosion and transport of Imidacloprid and Clothianidin in the upland field under simulated rainfall condition*

**Zhang N, Zhang H, Chen J:** *Bioaccumulation of organochlorine pesticides and polychlorinated biphenyls by the edible loaches and crabs living in rice paddy fields of Northeast China*

#### POLYCHLORINATED NAPHTHALENES AND CHLORINATED PARAFFINS (PCNs/CPs) (S 36)

**Brandsma SH, de Boer J, Leonards PEG:** *Chlorinated paraffins (C10-C31) in tire rubber granulates used on artificial-turf soccer fields*

**Cao D, Gao W, Wu J, Xin S, Wang Y, Jiang G:** *Occurrence of short- and medium-chain chlorinated paraffins in dust from plastic sports field and synthetic turf in Beijing, China*

**Chang K-S, Wu Ch-P, Chen Y-W, Chi K-H, Dat N-D, Chang MB:** *Measurement of PCNs in sediment of a reservoir in northern Taiwan*

**Dat N-D, Huang Y-Ch, Wang W-Ch, Luy J-M, Chang M-B:** *Characteristics of polychlorinated naphthalenes (PCNs) associated with ambient-air particles and fly ash collected from existing APCDs in Taiwan*

**Dat N-D, Lien Ch-G, Lyu J-M, Huang YJ, Wang WCh, Chang M-B:** *Reducing of polychlorinated naphthalenes (PCNs) emission from municipal waste incinerator*

**Dumas P:** *Quantification of polychlorinated paraffin (SCCPs, MCCPs) in human serum: A Complex analytical challenge*

**Falandysz J, Smith F, Fernandes A:** *Polychlorinated naphthalenes (PCNs) in cod liver oil and cod liver products sourced from the Baltic Sea and the North Atlantic Ocean*

**Guida Y, Meire RO, Sprengel J, Torres JPM, Vetter W:** *Short-chain chlorinated paraffins in air from southeastern Brazilian mountains*

**Hanari N, Falandysz J, Yamazaki E, Yamashita N:** *Possibilities of field experimental photolysis of polychlorinated naphthalenes*

**Jiang W, Huang T, Ma J:** *Chinese national gridded emission inventory and contamination of short-chain chlorinated paraffins to the biotic and abiotic environments in the Bohai Sea*

**Kajiwara N, Matsukami H:** *Chlorinated paraffins in consumer products on the Japanese market and their destruction behavior during waste incineration*

**Krätschmer K, Schächtele A, Malisch R:** *Analysing chlorinated paraffins: Intermediate results after round one of the interlaboratory study*

**Krätschmer K, Schächtele A, Malisch R, Vetter W:** *Chlorinated paraffins (CPs) in salmon and trout: Occurrence levels, homologue patterns and relation to other persistent organic pollutants*

**Labadie P, Goutte A, Maciejewski K, Simonnet-Laprade C, Le Menach K, Alliot F, Santos R, Budzinski H:** *Comparative trophodynamics of polychlorinated biphenyls and chlorinated paraffins in an urban river: case study on the River Orge (near Paris, France)*

**Leonards PEG, Koekkoek, J, Van Ginkel C:** *Analysis of medium chlorinated paraffins and closed bottle biodegradation tests*

**Li Z, Gong Y-Y, Holmes M, Pan X, Zou X, Shirima C, Kimanya M, Fernandes A:** *Geospatial visualisation of food contaminant distribution: polychlorinated naphthalenes (PCNs), polybrominated diphenylethers (PBDEs) and aflatoxins*

**Liu H, Gozhina O, Gorovoy A, Johansen JE:** *New standards of polychlorinated alkanes (SCCPs)*

**Meziere M, Cariou R, Marchand P, Bichon E, Monteau F, Dervilly-Pinel G:** *Adduct ions behaviour with respect to source parameters for the comprehensive LC-HRMS analysis of chlorinated paraffins (CPs)*

**Moeckel C, Lunder Halvorsen H, Pedersen LS, Krogseth IS, Bohlin-Nizzetto P, Borgen AR, Schlabach M, Breivik K:** *Spatial distribution of short- and medium-chain chlorinated paraffins in European background air*

**Schinkel L, Bogdal C, McNeill K, Heeb N:** *The CP/CO problem: Limitations of conventional GC-ECNI-MS when analyzing mixtures of chlorinated paraffins (CPs) and chlorinated olefins (COs)*

**Schinkel L, Knobloch M, Bogdal C, Lienemann P, McNeill K, Heeb N:** *Transformation of chlorinated paraffins to chlorinated olefins during metal drilling*

**Shin F-S, Choo G, Oh J-E, Chang Y-S:** *Monitoring of emerging POPs (Deca-BDE, PCNs, SCCPs) in fish and shellfish*

**Sprengel J, Vetter W:** *Synthesis and characterization of C10-C17 chloroparaffins with single chain lengths and their use for quantification via GC/ECNI-MS-SIM*

**Sprengel J, Wieselmann S, Vetter W:** *Chlorinated paraffins in dietary supplement oil capsules from the German market*

**van Mourik LM, Wang X, Toms LML, Leonards PEG, de Boer J, Mueller JF:** *Chlorinated paraffin levels in Australia: assessing spatial differences in ambient air and temporal trends in humans*

**Yuan B, Benskin JP, Chen C-E, Bergman Å:** *A new analytical method for chlorinated paraffins using bromide-anion attachment atmospheric pressure chemical ionization mass spectrometry*

## POPs AND EMERGING CONTAMINANTS IN DEVELOPING COUNTRIES (S 37)

**Birgul A, Yavuz-Guzel E, Daglioglu N, Kurt-Karakus PB:** *Determination of rainwater concentrations and wet deposition fluxes of the selected current-use pesticides (CUPs) in Bursa, Turkey*

**Clarke E, Asante KA, Nortey Ch, Osei-Fosu P, Kyeremateng-Amoah E, Appoh EKE, Fletcher AA, Adu-Kumi S, Weber R:** *Health and socio-economic assessment of persistent organic pollutants in vulnerable populations of Ghana*

**Fatunsin OT, Ajani Z, Olayinka KO, Oyeyiola AO:** *Method development and risk assessment of acrylamide from commonly consumed fried foods from Southwestern Nigeria*

**Fiedler H, Sobhanei S, Yeung LWY:** *First results of PFOS monitoring in surface waters of three continents*

**Gevao B, Porcelli M, Guijarro K, Rajagopalan S, Krishnan D, Bahloul M, Zafar J:** *Towards an understanding of short, medium, and long-term temporal trends in the atmospheric concentrations of persistent organic pollutants in Kuwait*

**Helou K, Karaki S, Harmouche Karaki M, Narbonne J-F:** *Review of available data on organochlorine pesticides and polychlorinated biphenyls residues in environment, food and humans in Lebanon*

**Macías-Zamora JV, Quezada-Hernández C, Sánchez-Osorio JL, Ramírez-Álvarez N, Hernández-Guzmán FA:** *A first look at PBDEs and other POPs in commercial harvest of *Mytilus* sp. and *Crassostrea* gigas from the Pacific coast of Mexico*

**Ni KT, Suhlaing Ch, Weber R:** *Development of the first HBCD inventory in Myanmar*

**Pongpiachan S, Hattayanone M, Tipmanee D, Suttinun O:** *Chemical characterisation of polycyclic aromatic hydrocarbons in coastal areas of Thailand affected by the 2013 Rayong Oil Spill*

**Pozo K, Diaz X, Metzdorff A, Corral M, Oyola G, Pribylova P, Estellano VH, Klánová J:** *Occurrence of polychlorinated biphenyls (PCBs) in the Chilean atmosphere using passive air samplers PUF disk*

**Pozo K, Metzdorff A, Estellano VH, Martinik J, Pribylova P, Klánová J:** *Levels of persistent organic pollutants (POPs) in the industrial area of Las Higueras Talcahuano, in central Chile, using passive air sampler PUF disk*

**Ramírez-Álvarez N, Macías-Zamora JV, Sánchez-Osorio JL, Hernández-Guzmán FA, Álvarez-Aguilar A, Valenzuela-Suarez BJ, Mejía-Trejo A:** *PBDEs in sediments and geoduck clam (*Panopea globosa*) from the Protected Natural Area of the Upper Gulf of California and Colorado Delta River, Mexico*

**Taveira Parente CE, Vollú RE, Carvalho GO, Azeredo A, Torres JPM, Meire RO, Seldin L, Malm O:** *Fluoroquinolone degradation ratio in poultry litter fertilized soils and persistence of biological impacts below analytical limits of detection – a field study*

**Tominaga MY, Niwa NA, Silva CR, Souza CAM, Sato MIZ:** *Stockholm Convention persistent organic pollutants monitoring activities in São Paulo State, Brazil*

**Torres JPM, Soares TAF, Guida YS, Vianna MS:** *Organochlorinated pesticides (OCPs; DDT and its metabolites) in soils from a small Native American (Guarani-Ñandeva - Tehoe Oco'y) territory near the Itaipu hydroelectric reservoir located at Paraná State, southern region of Brazil*

#### POPs AND EMERGING CONTAMINANTS IN URBAN ENVIRONMENT (S 38)

**Coggan TL, Szabo D, Moodie D, Shimeta J, Crosbie ND, Fernandes M, Lee E, Clarke BO:** *Investigation of the levels of per- and polyfluoroalkyl substances (PFAS) in aqueous matrices from nineteen Australian WWTPs*

**De la Torre A, Barbas B, Sanz P, Navarro I, Artiñano B, Martínez MA:** *PCDD/Fs and PCBs in urban ambient air: gas-particle partitioning, size distribution and inhalation risk*

**De Vivo B, Qu Ch, Albanese S, Lima A, Hope D, Fortelli A:** *The occurrence of OCPs, PCBs, and PAHs in the soil of Naples metropolitan area, southern Italy*

**Guardans R:** *A note on POPs in dated sediment cores from densely populated areas: global features in local histories and the future of air quality*

**Hai Ch V, Anh MT:** *Assessment of characteristic distribution of PCDD/Fs in medical waste incinerators*

**Han H, Woo JS, Bae YS, Lee YK, Kim DG, Park IB, Kim YJ, Song I, Jeong B, Kim JS:** *Atmospheric concentration of PCDD/PCDFs using active and passive sampler in Gyeonggi-do, Korea from 2011 to 2016*

**Jia L, Deng Y, Mao W, Yin H, Tao F, Huang F:** *Levels of PCDD/Fs in soils in the vicinity of the municipal solid waste incinerator in Shanghai, China*

**Kim H-J, Kim H-J, Lee Ch-H, Kim J-H, Jeon J-W, Son J-Y, Choi S-D:** *Levels and characteristics of HBCD in the air and soil in Republic of Korea*

**Lee B-H, Choi T-S, Jeon Y-R, Cha Y-H:** *Trends in national emissions of dioxins on a crematory in the Republic of Korea*

**Loyola-Sepulveda R, Salamanca Orrego M, Gutiérrez Baeza F, San Martín Figueroa C:** *Using a wide range of congeners of dioxins and furans to measure the contribution to the urban sediment signature*

**Malikova KhT, Naghiyeva SV, Aliyev FV:** *Determination of persistent organic pollutants – PCDDs, PCDFs and dl-PCBs in river and sea fishes in Azerbaijan*

**Roscales JL, Muñoz-Arnanz J, Ros M, Vicente A, Jiménez B:** *Does the number of field blanks influence reported air POP concentrations in monitoring programs based on PUF-PAS?*

**Roscales JL, Muñoz-Arnanz J, Ros M, Vicente A, Jiménez B:** *PCDD/Fs, dl-PCBs and PBDEs in urban areas from Spain*

**Saini A, Jariyasopit N, Harner T, Dabek-Zlotorzynska E, Celo V, Halappanavar S, Wu D, Gaga E.O, Evans G:** *Assessing toxicity of organics in urban source sectors for air (ATOUSSA)*

**Shunthirasingham Ch, Alexandrou N, Brice KA, Dryfhout-Clark H, Su K, Shin C, Park R, Pajda A, Noronha R, Hung H:** *Halogenated flame retardants in the atmosphere of the Canadian Great Lakes Basin*

**Styszko K, Skiba A, Samek L, Furman L, Zięba D, Kistler M, Kasper-Giebl A, Konduracka E:** *Polycyclic aromatic hydrocarbons and endocrine disrupting chemicals in ambient particles from southern Poland, and their potential health impact*

**Tikhonov G, Artaev V, Lebedev A:** *Multiple ionization modes in analysis of environmental samples using novel GCxGC-HR-TOFMS*

**Yoshiki R, Yamasaki T, Yamamoto K, Haga Y, Nakagoshi A, Fujimori K, Matsumura C:** *Benzotriazole UV stabilizers in water and atmosphere environment of Hyogo Prefecture, Japan*

**Zhou H, Zhao G:** *Microbial diversity and activity of an aged soil contaminated by polycyclic aromatic hydrocarbons*

#### POPs IN POLAR, CIRCUMPOLAR AND ALPINE REGIONS (S 39)

**Ademollo N, Corsolini S, Rauseo J, Casentini B, Amalfitano S, Zoppini A, Valsecchi S, Polesello S, Spataro F, Pescatore T, Patrolecco L:** *Dynamics of legacy and emerging pollutants in fjord ecosystems of the high Arctic: Svalbard (Norway) and NE Greenland*

**Aznar-Alemany Ò, Yang X, Alonso MB, Costa ES, Torres JPM, Malm O, Barceló D, Eljarrat E:** *Antarctic marine mammals as indicators of long-range transport of emerging pollutants*

**Balakrishna K, Vijayarathy S, Praveenkumarreddy Y, Gopal Ch, Eaglesham G, Jiang H, Bhat K:** *First report of pharmaceuticals and personal care products in the sea-ice of Larsemann Hills, Eastern Antarctica*

**Cabrerizo A, Muir DCG, De Silva A, Lamoreux S, Lafreniere M:** *Influence of permafrost disturbances on temporal trends of perfluoroalkyl substances (PFASs) and brominated flame retardants (BFRs) in landlocked Arctic char from lakes in the Canadian High Arctic*

**Corsolini S, Pala N, Martellini T, Baroni D, Cincinelli A:** *PCBs and PBDEs in soil, sediment and moss community from ponds across Victoria Land, Antarctica*



- Dietz R, Eulaers I, Desforges JP, Sonne C, Letcher RJ:** *An assessment of the biological effects of organohalogen exposure in Arctic wildlife and fish*
- Hermanson MH, Garmash O, Isaksson E, Teixeira C, Muir DCG:** *History of polychlorinated biphenyl deposition to snow and Ice from the Lomonosovfonna Glacier, Svalbard*
- Hung H, Wong F, Yu Y, Jantunen L, Barresi E, Sverko E, Dryfhout-Clark H, Fellin P:** *Temporal trends of persistent organic pollutants and chemicals of emerging Arctic concern in Arctic air*
- Kang J-H, Hwang H, Hur SD, Lee S-J, Choi S-D, Baek J-H:** *Determination of fire smoke proxies in the Greenland snow due to long-range transportation from North America*
- Krogseth IS, Breivik K, Wania, F:** *Development and evaluation of a bioaccumulation model for organic contaminants in European Arctic marine ecosystems*
- Lee I-S, Choi S-K, Choi M, Kim J-B:** *Levels and compositions of Perfluorinated chemicals in muscle tissues of Antarctic toothfish (*Dissostichus mawsoni*)*
- Li Y-F, Macdonald RW, Hung H, Kallenborn R:** *Historical budget of  $\beta$ -hexachlorocyclohexane ( $\beta$ -HCH) into the Arctic Ocean*
- Li YM, Hao YF, Wang P, Yang RQ, Zhang QH:** *Air monitoring of PCBs, PBDEs and OCPs in Arctic and west-Antarctic atmosphere during 2011-2016: Observation from XAD-2 resin passive air sampling*
- Metzdorff A, Pozo K, Roscales JL, Jiménez B, Cerro E, Dachs J, Přibyllová P, Galbán-Malagón C, Bergami E, Corsolini S:** *Novel brominated flame retardants (n-BFRs) in indoor dust from bases and vessel in Antarctica*
- Muir DCG, Houde M, De Silva AE, Butt C, Kirk J, Spencer C, Williamson M:** *Comparison of trends of perfluoroalkyl substances (PFASs) in ringed seals and in ocean waters across the Canadian Arctic*
- Pan SY, Yang YS, Lin CY, Wu, CP, Lin NH, Chi KH:** *PCDD/F measurement at high-altitude station in Eastern Asia: Evaluation of long-range transport and source apportionment of PCDD/Fs during the Southeast Asia biomass burning event in 2007-2016*
- Pouch A, Zaborska A, Pazdro K:** *Distribution of persistent organic pollutants in pelagic zone of the Arctic fjords*
- Souza JS, Cunha LS, Costa ES, Torres JPM:** *Polychlorinated biphenyls and organochlorine pesticides in Feathers of *Pygoscelis antarctica**
- Sun J, Bustnes JO, Bårdsen BJ, Covaci A, Dietz R, Helander B, Jaspers VLB, Malarvannan G, Sonne C, Thorup K, Tøttrup AP, Zubrod JP, Eens M, Eulaers I:** *Temporal trends of polychlorinated biphenyls in northern white-tailed eagle *Haliaeetus albicilla* populations*
- Yang R, Li Y, Zhang Q:** *Transport and deposition of persistent organic pollutants in the Southeast Tibetan Plateau*

#### QAQC OF POPs ANALYSIS - RECENT ISO AND NATIONAL STANDARDS (S 40)

- Archer JC, Moore M, Guo W, Bruce J, McLain M, Fairchild R, Hong H:** *Quality control algorithm for determining data acceptability*
- Esposito V, Bruno D, Maffei A, Giua R, Nicosia A, Ficocelli S:** *Validation of a PCDD/Fs long-term emission sampling system at a large sinter plant for assessment of compliance to permitted emission limit values*
- Horii Y, Takasuga T, Yamashita N, Miyazaki A:** *International standardization for determination of cyclic volatile methylsiloxanes in water*
- Liu H, Gozhina O, Gorovoy A, Midtaune H, Johansen JE:** *Development of PAH reference materials and internal standards*

**Prakash B, Byrne G, Ogura T:** *Determination of perfluorinated alkyl acids specified in EPA M537 and beyond in drinking waters using triple quadrupole LC/MS/MS systems*

**Ricci M, van Mourik LM, Lava R, de Boer J:** *Mission sccossible: A perspective view on the certification of the first reference material for short-chain chlorinated paraffins*

**Taniyasu S, Reiner EJ, Riddell N, Yamazaki E, Yamashita N:** *Interlaboratory trial for validation of ISO 21675 for per- and polyfluoroalkyl substances (PFAS) in water*

**Yamashita N, Taniyasu S, Yamazaki E, Wang XH, Falandysz J:** *The international standard method for measuring per- and polyfluoroalkyl substances in ambient air*

#### RISK ASSESSMENT AND RISK MANAGEMENT (S 41)

**Fatunsin OT, Ajani Z, Olayinka KO, Oyeyiola AO:** *Method development and risk assessment of acrylamide from commonly consumed fried foods from southwestern Nigeria*

**Koh D-H, Song W-S, Hwang J-H, Iwata H, Kim E-Y:** *Develop of in silico computational method for seeking the PPAR $\gamma$  ligand*

**Kwon SY, Seo S-H, Chang Y-S:** *Exposure assessment of perfluoroalkyl substances (PFASs) on the general population: 10-year trend and health effects*

**Ohajinwa CM, van Bodegom P, Vijver M, Peijnenburg W:** *Estimation of health risk of polybrominated diphenyl ethers at informal electronic waste recycling sites*

**Ring CL, Wikoff D, Budinsky RA, Haws LC:** *Bayesian approach to assessing uncertainty in dioxin reference dose*

**Wikoff D, Ring CL, Thompson C, Harris M, Haws LC:** *Continued refinement of relative potency (REP) estimates for dioxin-like compounds: Case study application of consistent methodologies to develop REP values*

**Wikoff D, Ring CL, Thompson C, Urban J, Budinsky RA, Haws LC:** *Characterization of the dose-response relationship for TCDD and changes in sperm concentration in rats using meta-regression: A feasibility assessment of quantitative evidence integration techniques*

#### SAMPLING, PREPARATION AND DETERMINATION (S 42)

**Addink R, Shir Khan H, Hall T, Germansderfer P:** *Fully automated, one step acid digestion, clean up and fractionation of POPs in fatty samples using modular and expendable columns packaged*

**Archer JC, Gentry JM, Jenkins Jr. RG, Shojaee S:** *Automated acid hydrolysis with abbreviated Soxhlet extraction for multiple matrices*

**Cerasa M, Mosca S, Budonaro A, Guerriero E, Rotatori M, Bacaloni A:** *Preliminary validation studies on ACF passive sampler for PCDD/Fs and PCBs in water*

**Cerasa M, Mosca S, Budonaro A, Paris E, Guerriero E, Rotatori M:** *Innovative fast SPE for the extraction of PCDD/Fs and dl-PCBs in aqueous samples – preliminary assessment*

**Chen S, Li XX, Feng F, Li SM:** *Highly efficient HPLC separation of xylene isomers and phthalate acid esters on a homemade DUT-67(Zr) packed column*

**Germansderfer P, Addink R, Hall T, Shir Khan H:** *Analysis of perfluorinated compounds in waste water using automated solid phase extraction*

**Hall T, Germansderfer P, Addink R, Shir Khan H:** *Analysis of base, neutral and acid semi-volatiles in municipal and industrial waste water by automated solid phase extraction*

**Hsu Y-Ch, Chang S-H, Chang M-B:** *Development of a continuous sampling system for POPs measurement*

**Huber S, Averina M, Box J:** *An automated high through-put sample preparation method for analysis of legacy POPs in human serum and plasma by atmospheric pressure GC-MS/MS*

**Jílková S, Melymuk L, Klánová J:** *Using HVAC filters as a sampler for indoor and outdoor air*

**Jílková S, Melymuk L, Vojta Š, Vykoukalová M; Bohlin-Nizzeto P, Klánová J:** *Small-scale spatial variability of flame retardants in indoor dust and implications for dust sampling*

**Kato Y, Sato A, Sotome Y, Aizawa K, Sano F, Matsumura M:** *Screening technique for the analysis of PCBs containing insulating oil*

**Kerkemeier T, Henkelmann B:** *Highly viscid matrices like PFAD or stearin in dioxin/PCB cleanup systems – viewpoint of the quality assurance*

**Puype F, Guzzonato A, Harrad S:** *Interpretation of principal component analysis for the evaluation of presence of WEEE-derived material in polymer based consumer goods*

**Li SM, Chen S, Zhang XL, Feng F:** *Application of metal-organic frameworks in solid phase extraction of persistent organic pollutants: A review*

**Shellie R, Ragunathan K, Gooley A, Jones R:** *Characterization of a new GC capillary column stationary phase for GC-MS analysis of polychlorinated biphenyl congeners*

**Schlabach M, Fiedler D, Myhre G, Gruber L, Vik AF, Schlummer M, Myhre CL, Rostkowski P:** *Unequivocal determination of fluorine on the surface of cross country skis prepared for competition by WD-XRF*

**Shirkhan H, Addink R, Hall T, Germansderfer P:** *Analysis of polychlorinated dibenzo-p-dioxins, furans and biphenyls in drinking water with semi-automated solid phase extraction*

**Sorokin AV, Ovcharenko VV, Turbabina KA, Kozhushkevich AI, Kalantaenko AM, Komarov AA:** *Extraction and clean-up of PFC from fish tissue with UPLC/Q-TOF-MS detection*

**Tsutsumi T, Kawashima A, Hamada N, Adachi R, Akiyama H:** *Performance of a polychlorinated biphenyl clean-up system followed by gas chromatography tandem mass spectrometry for determining polychlorinated biphenyls in fish and shellfish*

#### SOURCES, FATE, TRANSPORT, MODELLING AND INVENTORIES (S 43)

**Deng YY, Jia LJ, Mao WL, Yin HW, Tao F, Huang F:** *Atmospheric bulk deposition of polychlorinated dibenzo-p-dioxins and dibenzofurans (PCDD/Fs) in the vicinity of MSWI in Shanghai, China*

**Fiedler H, Malisch R, Schächtele A, Hoogenboom R, van Leeuwen S, Stephanowitz R, Knetsch G:** *Pattern database for identification of sources and transfers of polychlorinated dibenzo-p-dioxins, dibenzofurans and biphenyls*

**Hogarh JN, Bempah CK, Adu-Kumi S, Weber R:** *Inventory of polybrominated diphenyl ethers (PBDEs) in the transport sector in Ghana*

**Josefsson S, Norrlin N, Apler A, Gottby L, Larsson O, Nyberg J, Zillén L:** *Fibrous sediment from pulp & paper mills – contamination levels and spatial extent*

**Li Y-F:** *Prediction of slopes and intercepts from log-log correlations of gas/particle quotient and vapor-pressure & octanol-air partition coefficient for SVOCs*

**Mansouri E, Alamir B, Reggabi M:** *Inventory status of dioxins/ furans in Algeria*

**Monti C, Monti A:** *A comparison of PCDD/F fingerprints in ambient urban air of big cities: a continental and economic effect?*

**Nnorom I.C, Odeyingbo O, Dubzer O:** *Concern over environmental POPs contamination from open burning of electronic wastes in Nigeria: lessons from the Person in Port Project*



**Suciati F, Aviantara DW:** *Microplastics and the potential threat of unforeseen POPs exposure to Indonesian water*

**Pandelova M, Bussian BM, Henkelmann B, Schramm K.-W:** *PBDE levels in German forest soils*

**Pinas VA, Weber R:** *Suriname inventory of PFOS & related substances "The beauty and dirty beasts"*

**Rauert C, Harner T:** *Progress in tracking legacy and emerging POPs in the global atmosphere under the GAPS network*

**Solá-Gutiérrez C, San Román MF, Ortiz I:** *Aqueous oxidation of Triclosan: the potential formation of PCDD/Fs*

**Yang YH, Ngo TH, Pan SY, Wu CP, Tsai HT, Chi KH:** *Continuous nationwide PCDD/F air monitoring network in Taiwan (2006-2017): concentration variation, emission source apportionment and exposure risk assessment*

#### STRATEGY FOR A NON-TOXIC ENVIRONMENT: ADDRESSING PERSISTENCE (S 44)

**AlAfghani MM, Paramita D:** *Regulatory challenges in the phasing-out of persistent organic pollutants in Indonesia*

**Arkenbout A, Sarolea HA:** *Temperatures of post-combustion zone in a Waste-to-Energy incinerator*

**Bouman KJAM, Arkenbout A:** *Waste incineration emissions of dl-PCB, PBB, PBDD/F, PBDE, PFOS, PFOA and PAH*

**Boije af Gennäs U:** *EU strategy for a non-toxic environment: Way forward on very persistent substances*

**Fantke P, Jolliet O, Overcash M:** *Introducing the sustainability perspective in chemical substitution*

**Petrlik J, Bell L, Behnisch PA, Wangkiat A:** *High levels of PCDD/Fs around sites with waste containing POPs demonstrate the need to review current standards*

**Straková J, Petrlik J, Pulkrabová J, Gramblička T:** *Toxic recycling, or how unsorted waste may contaminate consumer products in the Czech Republic*

**Trier X:** *Developing indicators for groups of persistent substances in products, in the environment and in people*

**Weber R, Mahjoub B, Ben Hamouda A, de Miguel Wardle K, Outters M, Fantke P:** *Substituting hazardous chemicals in the Mediterranean region – Challenges and opportunities for safer and more sustainable solutions*

## Preliminary validation studies on ACF passive sampler for PCDD/Fs and PCBs in water

Cerasa M<sup>1,2</sup>, Mosca S<sup>1</sup>, Budonaro A<sup>1</sup>, Guerriero E<sup>1</sup>, Rotatori M<sup>1</sup>, Bacaloni A<sup>2</sup>

<sup>1</sup>CNR – IIA, Monterotondo, Rome, Italy, 00015, [marina.cerasa@iia.cnr.it](mailto:marina.cerasa@iia.cnr.it); <sup>2</sup>Sapienza Università di Roma, Roma, Italy, 00185

**Introduction:** Hydrophobic pollutants as polychlorinated biphenyls (PCBs), polychlorinated dibenzo-p-dioxins (PCDDs) and dibenzofurans (PCDFs) have frequently been identified in several matrices of aquatic ecosystems <sup>(1-3)</sup>. The knowledge of the actual concentrations of these pollutants is essential for integrated water quality management. Due to their very low, but toxicologically relevant levels in natural waters, direct determination of their concentrations is difficult with common analytical techniques.

Several passive samplers such as polyoxymethylene strips<sup>(4,5)</sup>, silicone rubber<sup>(5,6)</sup>, low density polyethylene (LDPE)<sup>(7)</sup>, and semi-permeable membrane devices (SPMDs)<sup>(8,9)</sup> have been commonly used in monitoring of organic compounds in aquatic environment <sup>(10)</sup>. Nowadays, activated carbon fiber (ACFs) are widely used in different sectors for their adsorptive capacity in pollutants abatement systems. Thanks to their large specific surface area (SSA) and porosity evenly distributed on the surface, ACFs have a reversible mass transfer (adsorption/desorption). Moreover, the material is lightweight (low density per m<sup>2</sup>), it is wrapped in different textiles (easy to handle) and it is fireproof <sup>(11)</sup>.

In this paper, preliminary validation studies for a passive sampler based on ACF for organic chlorinated pollutants in water are presented. The ACF passive sampler in water is assessed using efficiency required in EPA 1613B and EPA 1668B standard methods <sup>(12,13)</sup>.

**Materials and Methods:** *Chemicals and reagents;* Internal <sup>13</sup>C<sub>12</sub>-labeled standards WP-LCS, WP-ISS, EPA-1613LCS, EPA-1613ISS (Wellington Labs) were purchased from Chemical Research 2000. For chemical analysis, acetone, toluene, dichloromethane (DCM) were purchased from Romil. Water samples were collected from the Rome supply system managed by ACEA with an average conductivity of 546 µS/cm at 20 °C and a TOC of 0.6 mg C/L.

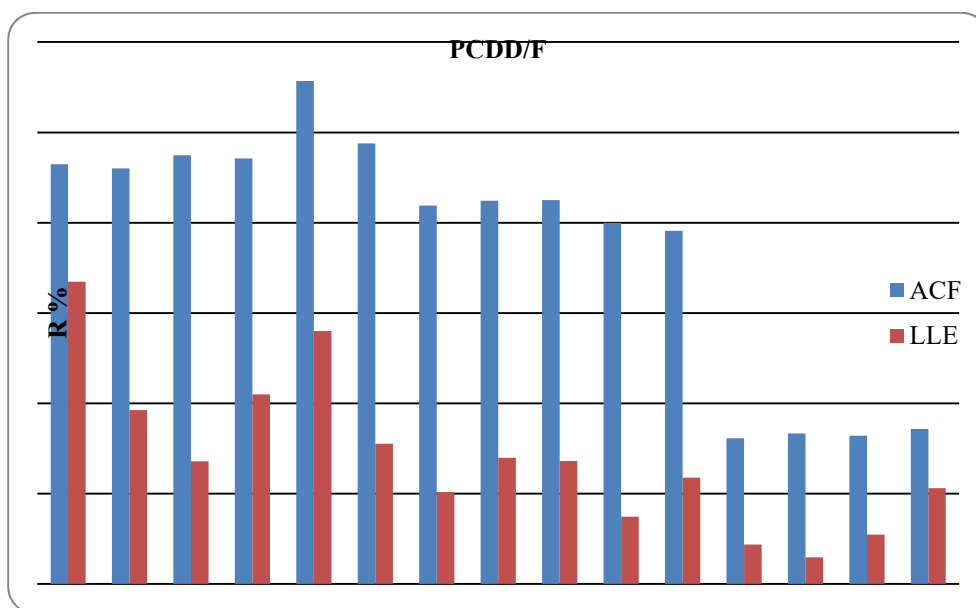
*Passive sampler:* A commercial ACF with a certified SSA > 2000 m<sup>2</sup>/g and a thickness of 1.5 mm, was used. The BET surface area analysis yield a real SSA of ~ 2500 m<sup>2</sup>/g and a micro porosity with a pores diameter of ~ 60 nm. An ACF of 8x5 cm (0.56 ± 0.02 g) square was inserted in a cellulose bag filter, pre-washed in DCM, and a cord of inert material was tied to the bag in order to suspend it in the water sample.

*Clean-up and analysis:* The clean-up consisted of a multilayer silica column (extract eluted with hexane) and an alumina micro column to separate PCDD/Fs from dl-PCBs. The eluted were concentrated and added with <sup>13</sup>C<sub>12</sub>-labelled syringe standards (WP-ISS and EPA1613-ISS for PCBs and PCDD/Fs, respectively). The instrumental analysis were performed by a triple quadrupole gas chromatograph/mass spectrometer (Trace 1310 GC/TSQ 8000 Evo, Thermo); the chromatographic separation were performed by a DB-XLB column (60 m x 0.25 mm, 0.25 µm I.D., Agilent J&W) <sup>(14)</sup>.

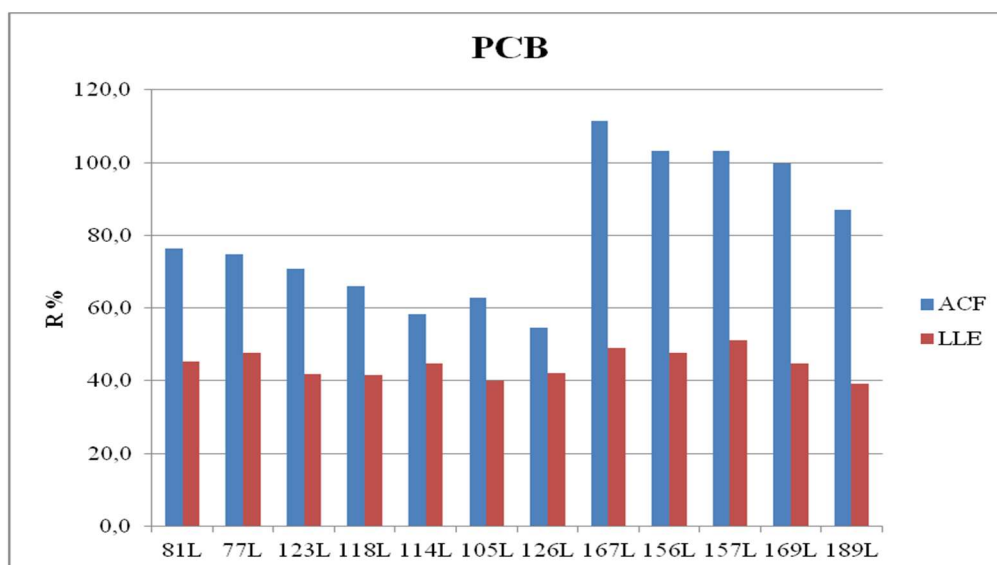
**Results and Discussion:** A suitable amount of WP-LCS and EPA-1613LCS standards are diluted to 5 mL of acetone and this standard solution spiked into a glass tank containing 24 L of tap water. The sample is shocked and left to stand for 24 h before the sampling, as to grant a uniform distribution of standard between water and suspended particulate matter.

An inert magnetic stirrer (40 mm x 5 mm E.D.) is added in the tank, and it is spinning at 300 rpm, in order to simulate a continuous mixing. The sampling lasted 48 h, an excess time, with the aim to study, in the future, adsorption kinetics and optimize sampling time. At the end of the sampling, the ACF was Soxhlet extracted with toluene for 36 h. Liquid/liquid extraction (LLE) was considered as the “reference” method, so at the same time, 24L water sample is extracted by dichloromethane. Due to the large volume, the sample was L/L extracted in 3 L aliquots, in a funnel with three times 300 mL of dichloromethane. The extracts (both from Soxhlet and from LLE) were then subjected to clean-up procedure and GC/MS analysis, as described in the previous section.

Method performance of the ACF sampler was assessed comparing percentage recoveries of the labeled compounds spiked in the water sample with the corresponding recovery tables in EPA 1613b and 1668b methods. Figures 1 and 2 show the percentage recoveries of  $^{13}\text{C}_{12}$ -labeled compounds WP-LCS and EPA 1613-LCS for both PCBs and PCDD/Fs, respectively, of the two extraction methods.



**Figure 1.** Comparison of percentage recoveries of  $^{13}\text{C}_{12}$ -labeled compounds EPA 1613-LCS.



**Figure 2.** Comparison of percentage recoveries of  $^{13}\text{C}_{12}$ -labeled compounds WP-LCS.

As it can be seen from the figures, recoveries are within the limits of EPA methods (25 - 150%). In general, ACF shows same recoveries or even higher than LLE.

*Conclusions:* The study showed that ACF responds positively to the range required by the method and shows a higher efficiency compared to the method taken as a reference. A study of this type opens the door to new tests designed to ascertain what is the breakthrough limit of the material and possibly of thinking enables the realization of passive samplers in water (e.g., rivers) averaged over time. Each sample needs to go through the enrichment and purification phases. The ideal is to be able to carry out

the two phases simultaneously in order to reduce analysis times and costs. In the future, the aim is to carry out a selective extraction of PCBs and PCDD/Fs or a decrease by oxidation of interfering directly on the trap of enrichment of the analytes. In addition, compared to the method taken as reference (liquid liquid extraction), the enrichment of a passive in ACF and the consequent method of extraction and purification is less laborious and time-consuming.

**References:**

- <sup>1</sup>Cardellicchio N, Buccolieri A, Giandomenico S, et al. (2007); *Mar. Pollut. Bull.* 55(10-12): 451-8
- <sup>2</sup>Oya S, Burak Karacık, Henkelmann B, et al. (2011); *Environ. Monit. Assess.* 176 (1-4): 51-65
- <sup>3</sup>Perugini M, Visciano P, Giammarino A, et al. (2007); *Chemosphere* 66(10): 1904-10
- <sup>4</sup>Cornelissen G, Gustafsson O, Bucheli TD, et al. (2005); *Environ. Sci. Technol.* 39 (18): 6881-95
- <sup>5</sup>Jacqueta R, Miègea C, Smedes F, et al. (2014); *Chemosphere* 98: 18-27
- <sup>6</sup>Smedes F, van Vliet LA, Booij K (2013); *Environ. Sci. Technol.* 47(1): 510-7
- <sup>7</sup>Allan IJ, Ruus A, Schaanning MT, et al. (2012); *Chemosphere* 423: 125-31
- <sup>8</sup>Verweij F, Booij K, Satumalay K, et al. (2004); *Chemosphere* 54(11): 1675-89
- <sup>9</sup>Wang J, Bi Y, Pfister G, Henkelmann B, et al. (2009); *Chemosphere* 75(8): 1119-27
- <sup>10</sup>Yılmaz A, Karacık B, Henkelmann B, et al. (2014); *Environ. Intern.* 73: 85-93
- <sup>12</sup>Marsh H, Rodríguez-Reinoso F (2006); *Activated Carbon* 1: 143-242
- <sup>13</sup>US EPA 1613b (1994); *Tetra Through Octa-Chlorinated Dioxins and Furans by Isotope Dilution High Resolution Gas Chromatography/High resolution Mass Spectrometry (HRGC/HRMS)*: EPA 921-B-94-005, 1994, re-issued March, 2012
- <sup>14</sup>US EPA 1668b (2008); *Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids and Tissue by HRGC/HRMS*