Characterization and Remediation of Per- and Polyfluoroalkyl Substances and Other Emerging Contaminants

(PFAS)

FINAL PROGRAM

Lead Organizer:
Dr. Hussain Al-Ekabi
Redox Technologies, Inc.
Western University Research Park, 100 Collip Circle,
London, Ontario N6G 4X8
Canada

Virtual Conference
May 10-12, 2021

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Important Notes:

1) The time in this program refers to the Central Europe Time Zone.
2) The total time (including Q/A) assigned for Keynote lectures is 25 min.
3) The total time (including Q/A) assigned for regular presentation is 20 min.
4) The total time (including Q/A) assigned for poster presentations is 10 min.
5) All presentations are power point.

MONDAY, MAY 10, 2021

Session A: PFAS Removal – Laboratory Work – I

11:00 – 11:25 Keynote Lecture
Field Applicability of New Methods for PFAS Removal from Water
Katrin Mackenzie, Anett Georgi, Sarah Sühnholz, Lin Qian, Navid Saeidi and Frank-Dieter Kopinke
Helmholtz-Center for Environmental Research - UFZ, Department of Environmental Engineering, Leipzig, Germany

11:25 – 11:45
Degradation of PFOS Adsorbed on Fe-zeolites under UV Irradiation
Lin Qian, Anett Georgi and Frank-Dieter Kopinke
Department of Environmental Engineering
Helmholtz Centre for Environmental Research - UFZ, Leipzig, Germany

11:45 – 12:05
Iron Minerals as Catalytic Activators for Persulfate for PFAS Degradation
Sarah Suehnholz, Frank-Dieter Kopinke and Katrin Mackenzie
Helmholtz-Center for Environmental Research - UFZ, Department of Environmental Engineering, Leipzig, Germany

12:05 – 12:10 **Discussion**

12:10 – 13:00 **Lunch Break**

13:00 – 13:20
Mechanism and Kinetics of Perfluorooctanoic Acid (PFOA) Degradation in Water by UV/Sulfite System
Zhongfei Ren and Tiina Leiviskä
Chemical Process Engineering, University of Oulu, Oulu, Finland

13:20 – 13:40 **Electrochemical degradation of PFASs in Wastewaters Using Boron Doped Diamond (BDD) Electrodes**
Uwayezu J. N[1]. Ivan Carabante[1], J. Kumpiene[1]
[1]Waste Science and Technology, Luleå University of Technology, Luleå, Sweden

13:40 – 13:45 **Discussion**

Session B: Field Experience of PFAS – I

13:45 – 14:05 **Framework for Evaluating Emerging Substances of Concern**
David Moore[1], Betsy Ruffle[2], Sagar Thakali[3] and Andrew McQueen[4]
[1]U.S. Army Corps of Engineers, Engineer Research and Development Center, Vicksburg, MS, USA
[2]AECOM Environment, Chelmsford, MA, USA
[3]AECOM Environment, Conshohocken, PA, USA
[4]U.S. Army Corps of Engineers, Engineer Research and Development Center, Vicksburg, MS, USA

14:05 – 14:25 **Alternatives for a PFAS Groundwater: Treatment Train Including an Emerging On-Site Destruction Technology**
Clive Rivers[1], Dave Woodward[2], Nathan Hagelin[2] and Rob Singer[2]
[1]Wood E&IS, Germany
[2]Wood E&I Solutions, USA

14:25 – 14:45 **PFAS Removal System for Town Water Supply in Australia**
Mark Rebentrost[2], Marilyn Sinnett[1] and Steve Woodard[3]
[1]San Diego, CA, USA
[2]Canberra, ACT, Australia
[3]Portland, ME, USA

14:45 – 14:50 **Discussion**

14:50 – 15:05 **Break**

15:05 – 15:25 **Perfluoroalkyl Substances (PFAS) in U.S. Market Basket Fish and Shellfish**
Betsy Ruffle[1], Dorin Bogdan[2], Martha Maier[3], Catherine Schwach[5] and Usha Vedagiri[4]
[1]AECOM, Chelmsford, MA, USA
[2]AECOM, Grand Rapids, MI, USA

[3]Vista Analytical Laboratory, El Dorado Hills, CA, USA
[4]Wood, Rancho Cordova, CA, USA
[5]AECOM, Oakland, CA, USA

15:25 – 15:45 **Airport/Airbase Aquifer PFAS Remediation using Resin Technology**
Mark Rebentrost[2], Marilyn Sinnett[1] and Steve Woodard[3]
1San Diego, CA, USA
2Canberra, ACT, Australia
3Portland, ME, USA

Session C: Pitch Presentations of Posters

15:45 – 15:55 **PFOA Removal from Aqueous Solution using Chitosan Beads**
Rahim Shahrokhi and Junboum Park *
Department of Civil and Environmental Engineering, Seoul National University, Seoul 08826, Republic of Korea

15:55 – 16: 05 **Reduction of Halogenated Organic Compounds in Water: Comparison of Catalysts and Reagents**
Ali Shee*, Frank-Dieter Kopinke and Katrin Mackenzie
Helmholtz Centre for Environmental Research - UFZ, Department of Environmental Engineering, Leipzig, Germany

16:05 – 16:15 **A Generic Method for the Quantification of 13 Legacy, Precursor and Substitute PFASs in Various Sample Matrices**
Jana Rupp, Thorsten Reemtsma and Urs Berger
Helmholtz Centre for Environmental Research – UFZ, Department of Analytical Chemistry, Leipzig, Germany

16:15 – 16:25 **Combined Adsorption and On-Site Adsorbent Regeneration for Treatment of Groundwater Contaminated with Chlorinated Hydrocarbons**
Hans-Jürgen Stanger[1], Silke Woszidlo and Anett Georgi[2]
[1] eneotech Umwelt GmbH, Ludwigshafen, Germany
[2] Helmholtz Centre for Environmental Research - UFZ, Department of Environmental Engineering, Leipzig, Germany

TUESDAY, MAY 11, 2021

Session D: PFAS Removal – Laboratory Work – II

11:00 – 11:20

Optimizing PFAS Adsorption by Improved Understanding of Surface Chemistry and Microporosity Effects

Anett Georgi[1], Navid Saeidi[1], Lin Qian[1], Zhe Yi[1,2], Urs Berger[2] and Frank-Dieter Kopinke[1]

[1] Helmholtz-Center for Environmental Research - UFZ, Department of Environmental Engineering, Leipzig, Germany

[2] Helmholtz-Center for Environmental Research - UFZ, Department of Analytical Chemistry, Leipzig, Germany

11:20 – 11:40

Electrosorption/Desorption for Removal of Perfluoroalkyl Acids from Water

Navid Saeidi, Anett Georgi and Frank-Dieter Kopinke

Helmholtz Center for Environmental Research – UFZ, Department of Environmental Engineering, Leipzig, Germany

11:40 – 12:00

Testing PFAS-Immobilization

Thomas Bierbaum[1], Hue Nguyen[1], Norbert Klaas[1], Claus Haslauer[1], Jürgen Braun[1], Frank Thomas Lange[2], Marco Scheurer[2]

[1]Universität Stuttgart, IWS/VEGAS, Stuttgart/Deutschland

[2]TZW: DVGW-Technologiezentrum Wasser, Karlsruhe/Deutschland

12:00 – 12:05

Discussion

12:05 – 13:00

Lunch Break

13:00 – 13:20

Organically Bonded Fluorine & PFAS – A Treatment Challenge?

Jurgen Buhl

Cornelsen Umwelttechnologie GmbH, Essen, Germany

13:20 – 13:40

CTA Organoclay as Propitious PFAS Remediation

Paul Scapan[1], Andrea Christine Guhl[1], Martin Bertau[1], Brigitte Haist-Gulde[2], Frank Sacher[2]

[1] Leipziger Str. 29, 09599 Freiberg, Germany; [2]Karlsruher Str. 84, 76139 Karlsruhe, Germany

13:40 – 14:00 **Potential of different remediation techniques for removal of PFAS from water samples. Case study: fire incident site in France**
Atefa Moravej
VALGO, Petit-Couronne – France

14:00 – 14:05 **Discussion**

Session E: Analytics of PFAS

14:05 – 14:25 **Using the TOP Assay to Detect Unknown PFAS in German Rivers**
Bernd Goeckener[1], Heinz Ruedel[1], Mark Buecking[1,2], Ina Fettig[3], Jan Koschorreck[3]
[1] Fraunhofer Institute for Molecular Biology and Applied Ecology IME, Schmallenberg, Germany
[2] School of Chemistry, Monash University, Victoria, Australia
[3] German Environment Agency (Umweltbundesamt), Berlin, Germany

14:25 – 14:45 **Compound-Specific Carbon Isotope Analysis (CSIA) to Determine the Origin and Degradation of Polyfluoroalkyl Substances (PFAS)**
Kevin Kuntze[1], Sarah Sühnholz[2], Katrin Mackenzie[2], Anett Georgi[2] and Anko Fischer[1]
[1]Isodetect GmbH, Leipzig, Germany
[2]Helmholtz-Zentrum für Umweltforschung - UFZ, Leipzig, Germany

14:45 – 15:05 **Modelling Sorption of Perfluoroalkyl Substances in Soils**
Joel Fabregat, Miquel Vidal, Anna Rigol
Department of Chemical Engineering and Analytical Chemistry, University of Barcelona, Spain

15:05 – 15:25 **A Novel Non-Target Method Using Ultra-High Resolution Mass Spectrometry for the Identification of PFAS in Environmental Samples**
Christine Wernicke, Nils G. Keltsch, Jan M. Kaesler, Oliver J. Lechtenfeld, Thorsten Reemtsma, Urs Berger
Helmholtz Centre for Environmental Research – UFZ, Department of Analytical Chemistry, DE-04318 Leipzig

15:25 – 15:30 **Discussion**

15:30 – 15:45 **Break**

Session F: Field Experience of PFAS – II

15:45 – 16:05 **Comparison of Innovative and Conventional Treatment Techniques of PFASs in Water and Soil**

Lutz Ahrens[1], Vera Franke[1], Mattias Sörengård[1], Winnie Nassazzi[1], Georgios Niarchos[2], Fritjof Fagerlund[2], Dan Berggren Kleja[3,4], Philip McCleaf [5] and Karin Wiberg[1]

[1] Department of Aquatic Sciences and Assessment, Swedish University of Agricultural Sciences (SLU), Uppsala, Sweden

[2] Department of Earth Sciences, Uppsala University, Uppsala, Sweden

[3] Department of Soil and Environment, Swedish University of Agricultural Sciences (SLU), Uppsala, Sweden

[4] Swedish Geotechnical Institute (SGI), Stockholm, Sweden

[5] Uppsala Water and Waste AB, Uppsala, Sweden

16:05 – 16:25 **Immobilisation of PFAS In Soil – A New Approach**

Jurgen Buhl

Cornelsen Umwelttechnologie GmbH, Essen, Germany

16:25 – 16:45 **Treatment Train Suggestion for Drinking Water Producers Dealing with Contaminated Raw Water**

Vera Franke[1], Philip McCleaf[2] and Lutz Ahrens[1]

[1]Department of Aquatic Sciences and Assessment, Swedish University of Agricultural Sciences (SLU), Uppsala, Sweden

[2] Uppsala Water and Waste AB, Uppsala, Sweden

16:45 – 17:05 **Distribution and Impact Study of Perfluorinated Compounds in the Various Environmental Representative Compartments of the Seine River, Following an Industrial Accident**

Hugo Carronnier

VALGO, Petit-Couronne – France

17:05 – 17:10 **Discussion**

WEDNESDAY, MAY 12, 2021

Session G: Other Contaminants – I

11:00 – 11:20 **Electrosorption of Polar Organic Micropollutants on Activated Carbon-Based Materials**

Jieying Zhou, **Navid Saeidi**, **Frank-Dieter Kopinke**, **Lukas Y. Wick and Anett Georgi**
Helmholtz Centre for Environmental Research – UFZ, Department of Environmental Engineering, Leipzig, Germany

11:20 – 11:40 **Estimation of Sorbed-Phase Biodegradation Rate in Activated Carbon Barriers Using Microbial Diagnostics, CSIA and *In Situ* Microcosms**

Jeremy Birnstingl[1]*, Matthew Burns[3] and Samuel Rosolina[2]
[1]Regenesis Ltd., Bath UK
[2]Microbial Insights, Knoxville, TN, USA
[3]WSP, Boston, MA, USA

11:40 – 12:00 **Iron-montmorillonite-cyclodextrin composites as recyclable sorbent-catalysts for the adsorption and surface oxidation of per-fluorinated compounds**

Samapti Kundu and Adi Radian*
Faculty of Civil and Environmental Engineering, Technion – Israel Institute of Technology, Technion City, Haifa 32000, Israel

12:00 – 12:20 **Combined Thermal Desorption of Chlorinated Solvents and PCBs**

Laurent Thannberger
VALGO, Petit-Couronne, France

12:20 – 12:25 **Discussion**

12:25 – 13:25 **Lunch Break**

Session H: Field Experience – PFAS – III

13:25 – 13:50 Keynote Lecture **Groundwater Remediation and Soil Washing: Best Practice Processes and Costs for PFAS-Contaminated Media**

Hans-Georg Edel
Züblin Umwelttechnik GmbH, Stuttgart, Germany

13:50 – 14:10 **Development of an In-Situ Remediation Method for PFAS Contaminations in the Vadose Zone - From Lab Experiments to Field Application**

Anja Wilken[1], Debora Reinke[2], Stephan Hüttmann[1], Harald Oeder[2], Martin Groß[3], Michael Schwarze[4] and Reinhard Schomäcker[3]
[1]Sensatec GmbH, Kiel, Germany
[2]GEOlogik Wilbers & Oeder GmbH, Münster, Germany
[3]Technische Universität Berlin, Department of Chemistry, Berlin, Germany
[4]Technische Universität Berlin, Department of Process Engineering, Berlin, Germany

14:10 – 14:30 **Development of a Remediation Concept and Long-Term Execution in a PFAS-fire Foam Damage Case**

Doreen Mäurer and Stefan Wagner
Tauw GmbH Germany, Münsters, Germany

14:30 – 14:35 **Discussion**

14:35 – 14:55 **Colloidal Activated Carbon for I*n Situ* Remediation of PFAS: A Review of Multiple Case Studies**

Jeremy Birnstingl[1], K. Thoreson, P. Erickson and S. Wilson[2]
[1]REGENESIS, Bath, UK
[2]REGENESIS, San Clemente, CA, USA

14:55 – 15:10 **PFAS Removal from Water by Plants**

Tommy Landberg and Maria Greger
Dept. of Ecology, Environment and Plant Sciences, Stockholm University, Stockholm, Sweden

15:10 – 15:15 **Discussion**

15:15 – 15:30 **Break**

Session I: Other Contaminants – II

15:30 – 15:50 **Nanoscale Zero-Valent Iron Particles: An Efficient Tool for Elimination of Persistent/Halogenated (F, Cl, Br) Compounds**

Viktorie Víchová[1], Jan Filip[1], Martin Solár[1], Tomáš Cajthaml[2,3] and Petr Kvapil[4]
[1]Regional Centre of Advanced Technologies and Materials, Palacký University, Olomouc, Czech Republic

[2]Institute of Microbiology, Czech Academy of Sciences, Prague, Czech Republic
[3]Institute for Environmental Studies, Faculty of Science, Charles University, Prague, Czech Republic
[4]Photon Water Technology s.r.o., Liberec, Czech Republic

15:50 – 16:10 **Tuning the Mobility of Particles for Nanoremediation Interventions: A Modeling Approach**
C. Bianco and T. Tosco, R. Sethi
Groundwater Engineering Group, DIATI, Torino, Italy

16:10 – 16:30 **Evaluation of Sources and Sinks for Chiral Pesticides in Groundwater – A Case Study**
Kevin Kuntze[1], Katerina Tsitonaki[2], Sandra Roost[2], Stella Dalby Agger[3], Schouw Christiansen[3], Nanette Levanius[4] and Anko Fischer[1]
[1] Isodetect GmbH, Leipzig, Germany
[2] Orbicon A/S, Taastrup, Denmark
[3] The Region of Zealand, Denmark

16:30 – 16:50 **Improved Detoxification of Hexachlorocyclohexane by Newly Developed Anaerobic Microbial Consortia**
Muhammad Imran Khan[1,2], Muhammad Hayder Ali[2], Carsten Vogt[1] and Ivonne Nijenhuis[1]
[1]Department of Isotope Biogeochemistry, Helmholtz Centre for Environmental Research- UFZ, Leipzig, Germany
[2]Institute of Soil and Environmental Sciences, University of Agriculture, Faisalabad, Pakistan

16:50 – 16:55 **Discussion**

16:55 – 17:00 **Closing Remarks**