



Occurrence of Emerging Micropollutants in Water and Their Control Strategy using Advanced Oxidation Process

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ABSTRACT

Surface water is commonly used as a source of drinking water in areas with growing urban populations. Micropollutants such as pharmaceuticals and personal care products (PPCPs) can flow into the water environment from various sources, such as pharmaceutical factories, households, antibiotics from livestock, agricultural effluents, aquaculture, and landfill leachate. The main PPCPs in surface waters and tap water are Diclofenac (DCF), Ibuprofen (IBU), Naproxen (NPX), Carbamazepine (CBM), Metoprolol (MTP), Sulfamethoxazole (SMZ), Sulfamethazine (SMA), Acetaminophen (ACT), and Caffeine (CFF). As another micropollutant category, endocrine-disrupting compounds such as bisphenol-A (BPA) and triclocarban (TCB) can cause dysfunctioning of the human endocrine system over time, even at very low levels. BPA has been widely utilized in the production of epoxy resins and polycarbonate plastics, such as food containers and baby bottles. TCB and triclosan are commonly found in personal care products, such as soaps, lotions, deodorants, toothpaste, and plastics. Due to high utilization of PPCPs, these micropollutants have been found in wastewater treatment plant (WWTP) effluent, surface water, and even tap water, in nanograms per liter up to micrograms per liter amounts. They cannot be completely removed using conventional water treatment processes (WTPs) such as coagulation and filtration, hence advanced water treatment technologies are adopted. The present talk aims to provide an overview on occurrence of emerging micropollutants in water and their control strategies. The most widely adopted process in WTPs in Korea is the advanced oxidation processes (AOP). In our research activities, fate and transport studies of micropollutants are being carried out by different AOPs such as photolysis, photocatalysis, ozonation, UV/chlorine, O₃/UV/H₂O₂ system using response surface methodology, ultrasonic waves and biologically active carbon. These processes are being designed to identify chemical decomposition mechanisms of micropollutants in water bodies.

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Time: 10:30 a.m. – 11:30 a.m.

Venue: Room ZS970, 9/F, Block Z,
The Hong Kong Polytechnic University,
181 Chatham Road South,
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SPEAKER'S BIOGRAPHY

Prof. Kyung-Duk Zoh obtained his PhD in 1998 from University of California (USA) and he is currently Professor at the Department of Environment Health in Seoul National University (South Korea). His fields of interest are environmental chemistry, especially water chemistry, water treatment, and environmental monitoring. The current focus areas of his research are (1) Treatment of emerging pollutants, (2) Fate and biogeochemistry of mercury species in the environment, (3) Monitoring and fate study of emerging micropollutants, (4) Exposure and risk assessment of emerging pollutants, and (5) Monitoring and investigation of chemical characteristics of trace pollutants in air. Prof. Zoh has renowned memberships of International Water Association (IWA), Society of Environmental Toxicology & Chemistry (SETAC), and American Chemical Society (ACS). Also, he has been serving as an Editor of Environmental Engineering Research journal and Conference Chair in IWA 11th Micropol & Ecohazard Conference (2019). Prof. Zoh has authored 86 international journal publications and 89 posters at international conferences. Since 2012, he has been a dedicated Member of Water Industry Development Forum of Korea Water Resources Corporation and Chair in Specialist Group of Micropollutant, Korean Society of Environmental Engineers.

*** All Interested Are Welcome ***

For further information, please contact Dr. Ben S.-Y. Leu at Tel. 3400-8322 or syleu@polyu.edu.hk. Free Admission. Certificates of attendance will be provided to participants if they attend the whole lecture.