

Investigating Types and Distributions of Adsorbed Persistent Organic Pollutants from Terrestrial to Marine Floating Microplastics (MPs)

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Abstract

Persistent organic pollutants (POPs) are adsorbed on microplastics (MPs), which act as a vector and made anthropogenic pollutions to the sea more complex. In this study, we investigated five types of POPs, including polychlorinated dibenzo-p-dioxins and -furans (PCDD/Fs), polybrominated dibenzo-p-dioxins and -furans (PBDD/Fs), polybrominated diphenyl ethers (PBDEs), polychlorinated biphenyls (PCBs) and polybrominated biphenyls (PBBs), in the MPs. The MPs are sampled from four coastal sites in south-west Taiwan; two sampling sites are located at Anping Port within Tainan area, and the other two are near Kaohsiung Port. Amounts and morphology of the four MPs were characterized and pre-treated for distinguishing concentrations of POPs of surficial adsorption and total sorption on MPs by applying our protocol. Meanwhile, seawater at the four sites were sampled simultaneously and determined following the same pre-treatment protocol for distinguishing dissolved phase and



particular-bound phase POPs in seawater. We were analyzed the distribution of POPs concentration as well as congeneric species between seawater and MPs. In general, the study provides an updated information of POPs' sorption behavior from terrestrial to marine floating MPs and fates in the seawater for scientific community and practical management aspects.

Biography

Justin Chun-Te Lin is currently a professor at Department of Environmental Engineering and Science, Feng Chia University, Taichung city, Taiwan. He was Associate and Assistant professor in the same Department and previously also worked in National Chiao Tung University, Chung Yuan Christian University, and National Taiwan University. He obtained his Ph.D. degree from Department of Chemical Engineering and Chemical Technology, Imperial College London, U.K in 2008 with full scholarship. He served as a project engineer prior studying abroad and have various industrial experiences in plant design, construction, operation and maintenance of various membrane systems. His laboratory worked on polymer membranes fabrication as well as separation and downstream purification process, process development and modelling, environmental nanotechnologies, water and wastewater treatment, microplastics, nanobubbles, and some environmental management topics related to sustainable metrics and life-cycle analysis.