An Li, J Environ Anal Toxicol 2018, Volume 8
DOI: 10.4172/2161-0525-C3-017

Polyhalogenated carbazoles: Occurrence, sources and environmental fate

An Li
University of Illinois, USA

Polyhalogenated carbazoles (PHCZs) are a class of halogenated dibenzopyrrole. They have a general molecular formula of $C_{12}H_{9-x-y-z}NCl_xBr_yI_z$. Their molecular structures resemble those of polyhalogenated dibenzofurans, with the oxygen atom replaced by an NH group. PHCZs are considered as chemicals of emerging concerns, because of the scarcity of information on their environmental occurrence and impact. The first environmental detection of PHCZs was reported in the 1980s. However, little progress was made until 2005 when an unexpected large accumulation of PHCZs in the sediments of Lake Michigan was discovered. Since then, the occurrence of PHCZs has been reported in sediments and food chains of natural waters including the Great Lakes, the San Francisco Bay, China's Taihu Lake and the Arctic Ocean. The physicochemical properties and the transformative potentials of PHCZs have also been investigated and they are found to be bioaccumulative in fish and photochemically labile. Some PHCZs have demonstrated dioxin-like toxicities. Sources of PHCZs found in the environment appear to include both natural formation and anthropogenic discharges. Little information is available on human exposure and the health of PHCZs. Research on PHCZs is at the very early stage; much is yet to be learned. In this presentation, I summarize the current knowledge based on a review of available literature and propose future research needs regarding PHCZs. The environmental occurrence and behavior of PHCZs will be compared with other polyhalogenated aromatic compounds, which include the highly toxic polychlorinated or polybrominated dibenzo-p-dioxins (PCDDs and PBDDs), dibenzofurans (PCDFs and PBDFs), biphenyls (PCBs and PBBs), diphenyl ethers (PCDEs and PBDEs) and naphthalenes (PCNs and PBNs).

Biography

An Li is an environmental chemist. She studies how human activities influence the natural environment and how the changes, in turn, affect human health. She holds a PhD in Water Chemistry and has been working as a faculty at in the School of Public Health, the University of Illinois at Chicago, since 1996. She is the first investiture Samuel and Catherine Epstein Professor. She has directed research projects funded by the U.S. EPA, NSF, NIH and other government agencies and her team has published about 90 peer-reviewed articles in highly ranked scientific journals.

anli@uic.edu

Notes: