

## Is It Time to Revisit PCB Remediation Practices?

**Rouzbeh Tehrani** (r.tehrani@temple.edu) (Temple University, Philadelphia, PA)  
Benoit Van Aken (bvanaken@gmu.edu) (George Mason University, Fairfax, VA)

Polychlorinated biphenyls (PCBs) are toxic anthropogenic pollutants that are stable in the environment and recalcitrant to complete biodegradation. Therefore, they are classified as persistent organic pollutants (POPs). Hydroxylated polychlorinated biphenyls (OH-PCBs) are formed in the environment by the oxidation of PCBs through a variety of mechanisms. As a consequence, OH-PCBs have been detected in a wide range of environmental samples. Although environmental concerns associated with PCBs have been the topic of an abundant literature, the formation of OH-PCBs and their detection in the environment have received comparatively little attention. OH-PCBs have recently raised environmental apprehensions because they exert a variety of toxic effects at lower doses than the parent PCBs. OH-PCBs have been shown to exert a range of estrogenic and antiestrogenic activities thus they are disruptors of the endocrine system.

Some remediation practices used for the treatment of PCB-contaminated soil and water are prone to generate OH-PCBs. There is enough scientific evidence that shows bioremediation by bacteria or plants (phytoremediation) generates OH-PCBs. Advanced oxidation processes (e.g., Fenton oxidation and ozonation) used for in situ soil remediation or wastewater treatment could also form more toxic and mobile PCBs byproducts. Therefore, the emerging literature suggests that this is time to revisit the current PCBs remediation practices as they might generate toxic and environmentally mobile byproducts.

Regulations regarding PCBs are primarily founded on the parent molecules and disregard the potential risk of PCBs metabolites or byproducts. The US Safe Drinking Water and Food Quality Protection Act requires monitoring estrogenic substances in drinking water, but it does not formally list OH-PCBs. Although OH-PCBs have been recognized as endocrine-disrupting compounds. This work suggests that the EPA should consider monitoring and consequently regulating OH-PCBs in the environment.