

農作物吸收 POPs 研究及其分析－以多溴二苯醚為例

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摘要

Crops contaminated by organic pollutants pose a great threat to food quality and human health. The main human exposure to some persistent organic pollutants (POPs) is through dietary intake. Recently, polybrominated diphenyl ethers (PBDEs), widely used as flame retardants, raise a serious public concern because they have been found in the environment and also detected in human. Some reports about the measured POP concentrations in food will be presented. For plants, they can scavenge organic contaminants such as POPs from the atmosphere and also uptake organic pollutants through root in soil. Agricultural products could be grown in the farms accidentally polluted by improperly treated wastewater, organic spill, and unaware groundwater contamination. With the increase of industrial development nowadays, more and more crops will be under the risk of noxious contamination. Plant lipid content and ambient temperatures had been proved to have a large effect on the pollution level in the plant. Although the lipid makes up a small fraction of the plant mass, our studies indicate that the contribution of lipid on organics sorption in plant is significant. The estimated lipid-water partition coefficients are mostly greater than corresponding K_{ow} . This shows that plant lipids are an effective partition solvent. The linear correlation between $\log K_{lip}$, the lipid-water partition coefficient, and $\log K_{ow}$, the octanol-water coefficient, for the aromatic compounds we studied is developed to predict the capacity of vegetation for a chemical when the plant composition and the K_{ow} of the chemical are available. Sorption of 4-BDE, one of PBDEs, and uptake of PBDEs into plants will be discussed. Since uptake of organic chemicals by vegetation could be a major source of food chain bioaccumulation and an important route of exposure to humans and animals, the trace amount of these POPs in crops needs more attention and more studies.

關鍵字：Uptake, Pollutants, PBDEs, lipid-water partition coefficient, octanol-water coefficient.