Biological and Photolytic Transformations

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The fate and biological activity of chlorinated compounds is very much dependent on their physico-chemical behaviour in aqueous systems. One of the most important limiting factors is solubility, which is discussed in the presentation of Hunziker et al for brominated compounds in respect of toxicity towards a marine alga. The biodegradability and transformation of halogenated compounds has been studied for both under aerobic and anaerobic conditions. The oxidative transformation is most effective in unspecific enzyme systems of ligninolytic fungi (white-rot fungi). Sonoki et al present data on the transformation of ABTS by culture supernatant of the fungus *Trametes versicolor* and also on enzymes isolated from these cultures.

The potential of anaerobic microbial communities to reductively dehalogenate many environmental pollutants has attracted intense research. Most work has focussed on transformation by mixed anaerobic populations from sediment samples or undefined enrichment cultures. Only limited work has been carried out with pure cultures, due to the very stringent redox conditions required for cultivation of the often unusual bacteria.

Parsons et al present data on the reductive debromination of decabromodiphenyl (BDE 209) by anaerobic microbial sediment communities, and Chiu et al discuss the transformation of aldrin by anaerobic river sediments and the influence of environmental factors on the transformation rate. Adrian et al present data on the transformation of polychlorinated dioxins by anaerobic enrichment cultures and the pure culture of *Dehalococcoides*.

Since corrinoids are involved in the reductive dehalogenation, the potential of super reduced corrinoids for transformation of the chloropesticide toxaphene was studied and demonstrated by v. d. Recke et al.

Photolysis of brominated diphenylethers (BDEs) in solution or adsorbed and transformation with the OH radical, are of great interest, because they depend on atmospheric and somewhat less the water residence times. Palm et al investigated the photolytic transformation pathways of BDEs in tetrahydrofuran solution via brominated dibenzofurans and present results on UV photolysis of adsorbed deca-BDE suspended in water. The rate constants of adsorbed deca-BDE are much lower than when it is in solution. Zetzsch et al measured a UV photolysis half-life of a few hours for BDE 153 in a THF solution. In contrast the photolysis of aerosol-borne BDE 153 yields a half-life of less than one day.