

Environmental biodegradation rates and pathways: Dependence on environmental conditions

CHAIRS: Kathrin Fenner, Gary Bending, Russell Davenport



Wednesday 14th May 2014, 10:45 – 12:50, room: Boston 1

For most organic pollutants, biodegradation is the primary process determining fate and persistence in the environment and within bioremediation systems. The capability to predict biotransformation rates and potentially recalcitrant products is therefore essential. However, it requires an understanding of how rates and pathways depend on the molecular structure of contaminants, their bioavailability and on the microbial consortia present under different environmental conditions. Recently, there have been enormous advances in analytical chemistry and molecular biology methods that allow determining the biotransformation rates and pathways of large sets of structurally diverse chemicals, as well as characterizing microbial communities in terms of community composition and expressed catabolic potential in a high-throughput fashion. The goal of this session is to bring together environmental chemists, microbiologists and engineers to share recent findings on how biotransformation rates and pathways depend on environmental conditions and/or microbial community characteristics, integrating understanding from terrestrial and aquatic systems, including engineered treatment systems such as activated sludge, river bank infiltration or constructed wetlands. Topics would include:

Techniques:

- Is -omics information useful for predicting biodegradation rates and pathways?
- In situ identification and characterization of degraders
- Pollutant bioavailability to degrading organisms

(Novel) results on dependencies:

- Role of diversity in determining biodegradation rates and pathways
- Dependence of biodegradation rates and pathways on redox conditions

Specific environmental/experimental settings:

- Biodegradation under oligotrophic conditions
- Adaptation of communities to degrade pollutants

SESSION TYPE: Platform and Poster