

# Environmental Chemistry in Switzerland



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Developed as new frontier of chemistry, nowadays, *Environmental Chemistry* is an active and modern interdisciplinary field of research. It plays a central role among the environmental sciences in the understanding of the complex environmental behavior of chemical compounds.

This special issue of *CHIMIA* attempts to highlight some of the most exciting current developments in this field in Switzerland. It encompasses a wide breath of research topics and challenges from the identification of emerging contaminants using state-of-the-art analytical instrumentation, evaluation of the dynamics and transformation processes of different vital and toxic compounds, and their ultimate impacts on the aquatic ecosystems.



Serge Stoll

In this issue, chemical aspects of nanoparticle ecotoxicology and interactions with various organisms are presented. Key physicochemical processes controlling the behavior of **manufactured nanoparticles** and role of natural organic matter are discussed. Current knowledge and recent progress on the bioavailability and toxicity of **mercury** species to aquatic primary producers, such as microalgae and macrophytes, are critically reviewed. Dynamics of different processes affecting the availability of critical nutrients such as **amino acids, peptides and proteins** with emphasis on the environmental photochemical transformation processes is examined. The complex relationship between **iron** chemistry and the biology of surface waters to highlight the parameters defining the forms that are accessible for phytoplankton growth are also assessed. Another article shows how the isotope effect and compound specific isotope analysis can be used to characterize **pollutant degradation** even if multiple processes take place simultaneously. Another contribution illustrates the capabilities of high performance liquid chromatography combined with high resolution tandem mass spectrometry to detect targeted **trace organic contaminants** and their transformation products, and unknown **emerging compounds** in wastewater and surface waters. The use of **integrative samplers** for polar and non-polar organic pesticides and PCBs to reveal industrial and agricultural pollution trends in Swiss rivers is also shown. Finally the potential of **chemical sensor probes** and in-resolution autonomous *in situ* detection approaches for the understanding of chemical aspects of complex aquatic systems is discussed.

We warmly thank all the colleagues for having contributed to this special issue and for the efforts in putting together an excellent and attractive collection of articles. We wish you a pleasant reading!

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