Studying aquatic photochemistry with laser spectroscopy and molecular probes

Kristopher McNeill

Institute of Biogeochemistry and Pollutant Dynamics, ETH Zurich,
Universitätstrasse 16, 8092 Zurich, Switzerland
kris.mcneill@env.ethz.ch

Triplet excited states of dissolved organic matter are important intermediates in the photochemistry of natural waters. They are strong oxidants that are central to many transformation reactions involved in the degradation of persistent and toxic substances. Additionally, these triplet states are the precursors for many other reactive species, including singlet oxygen, superoxide, hydrogen peroxide and hydroxyl radical. The study of these triplet states is made difficult by the fact that the they are not a single species, but a complex mixture of many chemical species. Recent work in our laboratory has focused on laser spectrscopy-based and molecular probe-based strategies that simplify the complex signal mixture arising from triplet states to yield information their reaction kinetics, oxidation potentials and triplet energies. This presentation will summarize recent progress in these efforts.

Biography

Kris McNeill received his B.A. in Chemistry from Reed College (Portland, Oregon) in 1992 and his Ph.D. in Chemistry from the University of California, Berkeley in 1997. At Berkeley, he was co-advised by Professors Robert Bergman and Richard Andersen. Following his PhD, he switched his research focus from organometallic chemistry to environmental chemistry. He was a postdoctoral researcher at MIT from 1997 to 1999 with Prof. Philip Gschwend in the department of Civil and Environmental Engineering. McNeill began his independent career as a faculty member at the University of Minnesota in the Department of Chemistry, holding ranks of Assistant Professor (2000-2006) and Associate Professor (2007-2009). In 2009, Kris McNeill joined the faculty of ETH Zurich, where he continues to apply physical organic chemistry to the study of environmental processes. He has received university-level teaching awards from both the University of Minnesota and ETH Zurich. He is a fellow of both the AAAS and the Royal Society of Chemistry.