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“Oxidative processes for water treatment: Are we on track?”

The presence of micropollutants in water resources and the urban water cycle from many sources such as agriculture, municipal wastewater and industry has raised concerns about the eco- and human toxicity of these compounds. The options for the reduction of the micropollutant load are manifold and range from source control (e.g., stricter regulations) to end of pipe solutions (wastewater and drinking water treatment). Several process options are available for the abatement of micropollutants in drinking water and/or wastewater such as soil passage, adsorption (e.g., activated carbon), removal by tight membranes (nanofiltration, reverse osmosis) and oxidation.

This talk will focus on oxidation processes where 4 aspects need to be considered for micropollutant abatement: (i) reaction kinetics, which control the efficiency of the process, (ii) elucidation of the formation of transformation products by experimental and theoretical approaches, (iii) formation of oxidation by-products from the matrix (e.g., bromate, nitrosamine), (iv) biological effects after oxidation, resulting from transformation products and/or oxidation by-products.

The talk will demonstrate these aspects with examples from oxidative drinking water and wastewater treatment.