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Preface

We, as Guest Editors, are very pleased to introduce you this Theme Issue of *Journal of Water Supply: Research and Technology–AQUA* on Oxidation Technologies for Drinking Water Treatment. After the first announcement on this Theme Issue, we received many intriguing manuscripts from all over the world. In the call for papers, we mentioned several potential topics. However, these manuscripts covered a much wider range of research topics than our expectation: from detailed reaction mechanisms to practical aspects of oxidation technologies for drinking water treatment. We realized the profoundness and richness of this area of environmental engineering/science during the review process. For these reasons, it was difficult for us to select a very limited number of studies for publication from these high quality manuscripts, but, at the same time, we are very proud of the outcomes of the review process. We believe that the nine selected papers for this issue cover various aspects of oxidation processes and provide insightful information to a wide range of engineers and scientists.

Oxidation is one of the key technologies for drinking water treatment. Oxidation is applicable to both disinfection and removal of contaminants. Even chlorination can be used for both purposes though the primary purpose of chlorination is disinfection. Two studies in this issue addressed the reaction between chlorine and micropollutants. Acero *et al.* investigated the oxidation of microxystin-LR, an algal toxin. They found 1,4-benzoquinone as a major reaction product. Also, Xagoraraki *et al.* focused on the chlorination of acetaminophen, a common pharmaceutical compound. Their investigations are interesting not only with regard to oxidation reactions by chlorine but also the selection of emerging compounds of interest to the drinking water community.

In most advanced oxidation processes (AOPs), the hydroxyl radical is the major oxidant because of its high reactivity. For this reason, gathering reliable kinetic information on the reactions of hydroxyl radical and environmental pollutants is essential for understanding and modeling AOPs. Linden *et al.* shed light on this in this Theme Issue by comparing hydroxyl radical rate constants obtained through UV/H_2O_2 and pulse radiolysis in laboratory experiments. In pilot- and full-scale tests Kommineni *et al.* examine methyl-tertiary butyl ether (MTBE) degradation during AOP treatment.

Other types of oxidation processes were also investigated in this Theme Issue. Sharma *et al.* applied ferrate(VI) oxidation for the transformation of endocrine disruptors and antimicrobials. Furthermore, Chen *et al.* utilized a bauxite-catalyzed ozonation process for micropollutant elimination. The new information in these studies is expected to be valuable for the development of more powerful, easy-to-use, and cost-effective water treatment systems in the future.

By its nature, any oxidation process produces various reaction by-products from the reaction with water matrix constituents. Unfortunately, some of these by-products are known to be toxic. Therefore, it is crucial to optimize oxidation processes for a good balance between desired oxidation/disinfection processes and by-product formation. In this Theme Issue, van der Helm *et al.* modeled a pilot-scale ozonation reactor with regard to disinfection and formation of bromate and assimilable organic carbon. Additionally, von Sonntag *et al.* looked at the detailed reaction mechanism of the oxidation Mn(II) by ozone to permanganate. In another example of the broad potential for using ozone, Fukuhara *et al.* evaluate the deterioration of granular activated carbon by ozonation.

In short, we are very happy to provide you this Theme Issue on Oxidation Technologies for Drinking Water Treatment. We appreciate the contributions by the authors, reviewers, and editorial staff of IWA to this project. We also welcome your comments and suggestions for this Theme Issue.

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