Environmental Science

Khan M.G. Mostofa · Takahito Yoshioka
Abdul Mottaleb · Davide Vione *Editors*

Photobiogeochemistry of Organic Matter

Principles and Practices in Water Environments

Springer

Synopsis of the book

Photoinduced processes, caused by natural sunlight, are key functions for sustaining all living organisms through production and transformation of organic matter (OM) in the biosphere. Production of hydrogen peroxide (H_2O_2) from OM is a primary step of photoinduced processes, because H_2O_2 acts as strong reductant and oxidant. It is potentially important in many aquatic reactions, also in association with photosynthesis.Allochthonous and autochthonous dissolved organic matter (DOM) can be involved into several photoinduced or biological processes. DOM subsequently undergoes several physical, chemical, photoinduced and biological processes, which can be affected by global warming. This book is uniquely structured to overview some vital issues, such as: DOM; H_2O_2 and ROOH; $HO^{\bullet}$; Degradation of DOM; CDOM, FDOM; Photosynthesis; Chlorophyll; Metal complexation, and Global warming, as well as their mutual interrelationships, based on updated scientific results.

Environmental Science and Engineering

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Editors Biography

Dr. Khan M. G. Mostofa Photochemist and Geochemist, is a Research Scientist at the State Key Laboratory of Environmental Geochemistry, Institute of Geochemistry, the Chinese Academy of Sciences, PR China. He received double MS degree (Chemistry, Jahangirnagar University, Dhaka, Bangladesh in 1992 and Biogeochemistry, Institute for Hydrospheric-Atmospheric Sciences (IHAS), Nagoya University, Japan in 2001) and Ph.D degree from Hiroshima University, Japan, in 2005 in the field of Environmental Dynamics and Management. Dr. Mostofa then joined as a postdoctoral fellow the Institute of Geochemistry, Chinese Academy of Sciences, China, 2006–2008. He has then been appointed as Associate Professor in the same Institute on 2008 and presently holds that position. Dr. Mostofa also worked as key researcher on several international projects, particularly on the Montreal Protocol Project entitled 'Institutional strengthening for the Phase out of ODSs in Bangladesh', 1996–1999, Bangladesh and the global "International Geosphere-Biosphere Program (IGBP)" project, 1999–2001, Japan. Currently, Dr. Mostofa served as reviewer for several international peer-reviewed Journals. His key researches are mostly focused on the photo-bio-geochemistry of organic matter and nutrients, characterization and identification of organic substances of both allochthonous and autochthonous origins, complexation of OM with trace metal ions, photosynthesis and global warming. Approximately three years were needed to complete the primary drafts of the manuscripts for the ten chapters in this book.

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Davide Vione Received his summa cum laude Laurea degree in Chemistry at the University of Torino (Italy) in 1998, and the Ph.D. in Chemistry in 2001. In 2002–2011 he has been University Lecturer in Torino, and he was appointed Associate Professor in 2011. His research interests focus on environmental photochemistry, particularly the sunlight-driven processes that involve transient species in surface and atmospheric waters, and on Advanced Oxidation Processes for water and wastewater decontamination. In June 2012 the ISI database reported 107 entries under his name, with 1,499 citations and h index 22 (for Scopus: 110 entries, 1,549 citations, h index 22). In 2003 Dr. Vione was presented the Young Researcher's award from the Analytical Chemistry division of the Italian Chemical Society (SCI) and the "European Young Researcher of the Year" award by the European Association of Chemistry and the Environment (ACE). He is Editorial Board Member of the E-Journal of Chemistry, and reviews around 30 articles per year for several environmental chemistry journals. Dr. Vione has contributed some chapters as a co-author as well as an editor of this book.

Dr. M. Abdul Mottaleb Received B.Sc. (Honors) and Masters of Science degree in Applied Chemistry from the University of Rajshahi, Rajshahi, Bangladesh. He earned his Ph.D. degree in Analytical and Environmental Chemistry/ Sciences from the University of Strathclyde, Glasgow, UK. Over past 22 years Dr. Mottaleb got experience in teaching and research in the area of analytical and environmental sciences in different countries: Bangladesh, United Kingdom, South Korea and the United States of America. Examples are (i) Scientific officer, Bangladesh Atomic Energy Commission, (ii) Associate Professor in Chemistry, University of Rajshahi, Bangladesh, (iii) KOSFE postdoctoral research fellow, South Korea, (iv) Research Associate, National Exposure Research Laboratory, U.S. Environmental Protection Agency (EPA), Las Vegas, Nevada, and (v) Research Scientist/Professor, Baylor University, Texas. Dr. Mottaleb was a recipient of the Science Achievement Awards (SAA) in Chemistry 2005, and Science & Technological Achievement Awards (STAA) 2005, offered by U.S. EPA and American Chemical Society, for his outstanding and impressive discovery of emerging contaminants and nitro musk-haemoglobin adducts in aquatic organisms such as fish. Currently Dr. Mottaleb is working as an Analytical Chemist at the Center for Innovation and Entrepreneurship, Northwest Missouri State University, USA and is

also serving as Editorial Board Member of peer-reviewed journals; Phytochemical Analysis, Maejo International Journal of Science and Technology, International Journal of Current Research, International Journal of Pure and Applied Sciences and Technology as well as a reviewer for many professional journals. Dr. Mottaleb contributes some chapters as a co-author as well as an editor of this book.

Dr. Takahito Yoshioka Received his Doctor of Science degree from Nagoya University on the mechanism of lacustrine nitrification. Dr. Yoshioka got experience in several organizations such as the Mitsubishi-Kasei Institute for Life Sciences (1984–1986), Faculty of Science in Shinshu University (1988–1992), Institute for Hydrospheric-Atmospheric Sciences in Nagoya University (1993–2000), Research Institute for Humanity and Nature (2001–2006) and Field Science Education and Research Center in Kyoto University (2007 to date). Dr. Yoshioka is distinguished as one of the Japanese pioneers of stable isotope ecology. Dr. Yoshioka was awarded a Biwako Prize for Ecology in 1999, for his outstanding contribution to stable isotope studies of lacustrine ecosystems. During the IGBP project (1997–2001), Dr. Yoshioka studied the dynamics of freshwater dissolved organic matter with Dr. Mostofa, using three-dimensional Fluorescence Spectroscopy, Ultra-filtration and Stable Isotope Techniques. Dr. Yoshioka was former Editor-In-Chief of Limnology (Springer-Verlag) and will contribute some chapters as co-author as well as an editor of this book.