

Contents

Part I Occurrence Concentrations, Sources and Fluxes of Xenobiotics in Urban Waters

1 Quantitative Mass Flows of Selected Xenobiotics in Urban Waters and Waste Water Treatment Plants.....	3
Kai Bester, Christa S. McArdell, Cajsa Wahlberg, and Thomas D. Bucheli	
2 Identifying and Classifying the Sources and Uses of Xenobiotics in Urban Environments.....	27
Erica Donner, Eva Eriksson, Hans-Christian Holten-Lützhøft, Lian Scholes, Mike Revitt, and Anna Ledin	
3 Illicit Drugs in the Urban Water Cycle	51
Maria Huerta-Fontela, Maria Teresa Galceran, and Francesc Ventura	
4 Precious Metals in Urban Aquatic Systems: Platinum, Palladium and Rhodium: Sources, Occurrence, Bioavailability and Effects.....	73
Nadine Haus, Sonja Zimmermann, and Bernd Sures	
5 Fate and Effects of Little Investigated Scents in the Aquatic Environment	87
Richard Bolek and Klaus Kümmerer	
6 Sources and Occurrence of Cyanotoxins Worldwide.....	101
Miguel Pelaez, Maria G. Antoniou, Xuexiang He, Dionysios D. Dionysiou, Armah A. de la Cruz, Katerina Tsimeli, Theodoros Triantis, Anastasia Hiskia, Triantafyllos Kaloudis, Christopher Williams, Mark Aubel, Andrew Chapman, Amanda Foss, Urooj Khan, Kevin E. O'Shea, and Judy Westrick	

7 Occurrence and Measurements of Organic Xenobiotic Compounds in Harbour and Coastal Sediments.....	129
Giusy Lofrano, Anastasia Nikolaou, Maria Kostopoulou, Giovanni Pagano, Vincenzo Belgiorno, and Rodolfo Maria Alessandro Napoli	
8 Determination of Sources and Emissions of Persistent Organic Contaminants by Means of Sewage Sludge: Results from a Monitoring Network	147
Thomas Kupper, Luiz Felipe de Alencastro, and Jean-Daniel Berset	
Part II Fate, Effects and Risks of Xenobiotics in Urban Waters	
9 Metabolic and Co-metabolic Degradation of Industrially Important Chlorinated Organics Under Aerobic Conditions.....	161
Ferhan Çeçen, Bilge Alpaslan Kocamemi, and Özgür Aktaş	
10 Photochemical Transformation of Pharmaceuticals in the Aquatic Environment: Reaction Pathways and Intermediates	179
Ioannis K. Konstantinou, Dimitra A. Lambropoulou, and Triantafyllos A. Albanis	
11 The Challenge of the Identification and Quantification of Transformation Products in the Aquatic Environment Using High Resolution Mass Spectrometry	195
Juliane Hollender, Heinz Singer, Dolores Hernando, Tina Kosjek, and Ester Heath	
12 Transport and Fate of Xenobiotics in the Urban Water Cycle: Studies in Halle/Saale and Leipzig (Germany)	213
Mario Schirmer, Frido Reinstorf, Sebastian Leschik, Andreas Musolff, Ronald Krieg, Karsten Osenbrück, Marion Martien, Kristin Schirmer, and Gerhard Strauch	
13 Pharmaceutical Contaminants in Urban Water Cycles: A Discussion of Novel Concepts for Environmental Risk Assessment	227
Stefan Scholz, Kristin Schirmer, and Rolf Altenburger	

14 Hydroxy Benzoate Preservatives (Parabens) in the Environment: Data for Environmental Toxicity Assessment	245
Ingrid Bazin, Aurelie Gadal, Eveline Touraud, and Benoit Roig	
Part III Treatment Methods	
15 Efficiency of Removal of Compounds with Estrogenic Activity During Wastewater Treatment: Effects of Various Removal Techniques	261
Margaretha H. Lamoree, Johanna G.M. Derksen, Sander C. van der Linden, Cora A. Uijterlinde, and Pim de Voogt	
16 Criteria for Designing Sewage Treatment Plants for Enhanced Removal of Organic Micropollutants.....	283
Francisco Omil, Sonia Suárez, Marta Carballa, Rubén Reif, and Juan M. Lema	
17 Xenobiotics Removal by Membrane Technology: An Overview	307
Andrea J C Semião and Andrea I Schäfer	
18 Membrane BioReactors: A Cost-Effective Solution to Enhance the Removal of Xenobiotics from Urban Wastewaters?	339
Francesco Fatone	
19 Removal of Xenobiotics from Wastewater in Sequencing Batch Reactors: Conventional and Two-Phase Configurations	355
M. Concetta Tomei, M. Cristina Annesini, and Andrew J. Daugulis	
20 Fate and Occurrence of Surfactants-Derived Alkylphenolic Compounds in Conventional and Membrane Bioreactor (MBR) Wastewater Treatment Plants	375
Mira Petrović and Damia Barceló	
21 Removal of Xenobiotic Compounds from Water and Wastewater by Advanced Oxidation Processes.....	387
Despo Fatta-Kassinos, Evroula Hapeshi, Sixto Malato, Dionisis Mantzavinos, Luigi Rizzo, and Nikos P. Xekoukoulotakis	

22	Biological, Chemical and Photochemical Treatment of Commercially Important Naphthalene Sulphonates	413
	Idil Arslan-Alaton and Tugba Olmez-Hanci	
23	Uptake of Xenobiotics from Polluted Waters by Plants	431
	Tomas Vanek, Radka Podlipna, Zuzana Fialova, Sarka Petrova, and Petr Soudek	
24	Treatment Techniques and Analysis of Stormwater Run-off from Roads in Hamburg, Germany	445
	Burkhard Stachel, Jens-Uwe Holthuis, Wolfgang Schulz, Wolfram Seitz, Walter H. Weber, Klaus-Thorsten Tegge, and Ingo Dobner	
Part IV Mitigation Measures – Technical and Socioeconomic Instruments		
25	Options for Mitigation: An Overview of Measures.....	465
	Cajsa Wahlberg and Arne Jamtrot	
Part V Outlook		
26	Outlook.....	483
	Kai Bester, Despo Fatta-Kassinos, and Klaus Kümmerer	
	Abbreviations	487
	Index.....	501