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Nota di contenuto	Functional Nanostructured Materials and Membranes for Water Treatment; Contents; Foreword; Series Editor Preface; Acknowledgments; About the Series Editor; About the Volume Editors; List of Contributors; 1 Target Areas for Nanotechnology Development for Water Treatment and Desalination; 1.1 The Future of Water Treatment: Where Should We Target Our Efforts?; 1.2 Practical Considerations for Nanotechnology Developers; 1.3 The Water Treatment Market for New Nanotechnology; 1.4 Purpose of This Book; 1.5 Concluding Remarks; References; 2 Destruction of Organics in Water via Iron Nanoparticles 2.1 Introduction2.2 Nanoparticles as Catalysts; 2.2.1 Colloidal Nanoparticles; 2.2.2 Supported Nanoparticles; 2.3 Advanced Oxidation Processes; 2.3.1 Fenton-Like Reactions; 2.3.1.1 Iron Oxide as Heterogeneous Nanocatalyst; 2.3.2 Photo-Fenton Reactions; 2.3.3

Nanocatalytic Wet Oxidation; 2.4 Nano Zero-Valent Iron (nZVI); 2.4.1 Synthesizing Methods; 2.4.1.1 Emulsified Zero-Valent Iron; 2.4.2 Degradation Mechanism; 2.4.3 Field Application of nZVI; 2.5 Bimetallic nZVI Nanoparticles; 2.6 Summary; References; 3 Photocatalysis at Nanostructured Titania for Sensing Applications; 3.1 Background 3.1.1 Photocatalysis at TiO₂ Nanomaterials 3.1.2 Photoelectrocatalysis at TiO₂ Nanomaterials; 3.2 Fabrication of TiO₂ Photoanodes; 3.2.1 Common Fabrication Techniques and Substrates for Photoanodes; 3.2.2 TiO₂/BDD Photoanode; 3.2.3 TiO₂ Mixed-Phase Photoanode; 3.2.4 CNTs/TiO₂ Composite Photoanode; 3.3 The Sensing Application of TiO₂ Photocatalysis; 3.3.1 Photocatalytic Determination of TOC; 3.3.2 Photocatalytic Determination of COD; 3.4 The Sensing Application of TiO₂ Photoelectrocatalysis; 3.4.1 Probe-Type TiO₂ Photoanode for Determination of COD 3.4.2 Exhaustive Degradation Mode for Determination of COD 3.4.3 Partial Oxidation Mode for Determination of COD; 3.4.4 UV-LED for Miniature Photoelectrochemical Detectors; 3.4.5 Photoelectrochemical Universal Detector for Organic Compounds; 3.5 Photocatalytic Gas Sensing; 3.5.1 The Photoelectrocatalytic Generation of Analytical Signal; 3.5.2 Photocatalytic Surface Self-Cleaning for Enhancement of Analytical Signal; 3.6 Conclusions; References; 4 Mesoporous Materials for Water Treatment; 4.1 Adsorption of Heavy Metal Ions; 4.2 Adsorption of Anions; 4.3 Adsorption of Organic Pollutants 4.4 Multifunctional Modification of Sorbents 4.5 Photocatalytic Degradation of Organic Pollutants; 4.6 Conclusions and Outlook; Acknowledgments; References; 5 Membrane Surface Nanostructuring with Terminally Anchored Polymer Chains; 5.1 Introduction; 5.2 Membrane Fouling; 5.3 Strategies for Mitigation of Membrane Fouling and Scaling; 5.4 Membrane Surface Structuring via Graft Polymerization; 5.4.1 Overview; 5.4.2 Reaction Schemes for Graft Polymerization; 5.4.3 Surface Activation with Vinyl Monomers; 5.4.4 Surface Activation with Chemical Initiators 5.4.5 Irradiation-Induced Graft Polymerization

Sommario/riassunto

With its emphasis on the application of nanotechnology to improve water treatment processes, this ready reference and handbook addresses the real needs of scientists and others working in the industry. It thus covers materials ranging from ceramic membranes, to functional nanoparticles, carbon nanotubes, and biological materials, as well as theoretical aspects. Each chapter is written by leading international experts in the field, examining in detail desalination, adsorption, filtration, the destruction and conversion of pollutants, as well as the monitoring of water quality, while discussi
