1. Record Nr. UNINA9911019483203321

Autore	Oppenlander Thomas
Titolo	Photochemical purification of water and air / / Thomas Oppenlander
Pubbl/distr/stampa	Weinheim, : Wiley-VCH, c2003
ISBN	9786610921652 9781280921650 128092165X 9783527610884 352761088X 9783527610891 3527610898
Descrizione fisica	1 online resource (386 p.)
Disciplina	541.393 628.1662
Soggetti	Air - Purification - Photocatalysis Photochemistry Water - Purification - Oxidation Water - Purification - Photocatalysis Purificació de l'aire Fotocatàlisi Fotoquímica Depuració de l'aigua Oxidació Llibres electrònics
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Photochemical Purification of Water and Air; Foreword; Curriculum vitae; Preface; Contents; Abbreviations and Symbols; Introduction; 1 AOPs and AOTs; 2 Why UV and Oxidation/Disinfection?; 2.1 Global Water Resources and Resulting Water Market; 2.2 Present and Historical Dimensions of the Radiation Concept; 2.3 Some Historical Landmarks of the Development of AOTs; References; 3 Interaction of UV/VIS

Radiation with Matter; 3.1 Photoscience in Research and Development; 3.2 Physical Constants and Standard Values Used in Photochemistry; 3.3 The Electromagnetic Wave
3.4 The Photon Stream and Planck's Equation3.5 Electromagnetic Spectral Ranges of Interest in Photochemistry; 3.6 Conversion of Energy Units and Other Useful Conversions; 3.7 Photon Energies, Bond Dissociation Energies, Threshold Wavelengths and Absorption Onset of Molecules; 3.8 Absorption of UV Radiation by Molecules; 3.9 The Beer-Lambert Relationship; 3.10 The Nature of Electronically Excited States; 3.11 The Jablonski Diagram; 3.12 Absorption of UV/VIS Radiation by Solids
3.13 UV/VIS Radiation as a Specific Reagent: Quantum Yield, Quantum Efficiency, Actinometry and Photoreaction Kinetics3.14 Terms Associated with the Emission and Receipt of Electromagnetic Radiation; 3.15 Safety Precautions for Radiant Sources; References; 4 VUV and UV Radiant Sources and their Characteristics; 4.1 Types of Lamps used in AOP Research and Development; 4.2 Specific Properties of Mercury Arc Lamps; 4.3 Development of Incoherent Excimer Lamps; 4.4 Typical Photon Flow of VUV or UV Lamps; 4.5 The Sun as Radiation Source; References; 5 Photochemical Processes of Water Treatment
5.1 Description of Aqueous Systems5.1.1 Classification of Water Constituents; 5.1.2 Analytical Parameters of Water Quality; 5.1.3 Synopsis: Water and Wastewater Treatment Technologies; 5.1.4 Synopsis: Oxidative Water Treatment Technologies and Methods of Hydroxyl Radical Production; 5.2 Nomenclature of Photochemical AOPs; 5.2.1 Photooxidation Reactions; 5.2.2 Photocatalytic Reactions; 5.3 General Reaction Schemes; 5.3.1 Photo-Initiated Oxidations; 5.3.2 Heterogeneous Photocatalysis; 5.3.3 Homogeneous Photocatalysis; 5.3.4 Photolysis of Water
5.4 Status of Technical Realization of Photo-initiated AOPs and Photochemical Treatment Strategies5.5 Photodegradation of Water Pollutants; References; 6 Properties, Reactivity and Photochemistry of Auxiliary Chemicals; 6.1 Electronic Structures of Oxygen Species Involved; 6.2 Reduction Potentials; 6.3 UV Absorption Properties of Auxiliary Oxidants, Catalysts and of Reactive Intermediates; 6.4 Physical-chemical Properties of Ozone and Hydrogen Peroxide; 6.4.1 Ozone; 6.4.2 Hydrogen Peroxide; 6.4.3 Photochemistry of Hydrogen Peroxide; 6.5 Photocatalysts; 6.6 Quantum Yields
6.7 Primary and Secondary Reactive Species

Sommario/riassunto

While the treatment of water and exhaust gas using ultraviolet (UV) light offers both ecological and economic advantages, information on photo-initiated advanced oxidation technologies (AOTs) has been dispersed among various journals and proceedings until now. This authoritative and comprehensive handbook is the first to cover both the photochemical fundamentals and practical applications, including a description of advanced oxidation processes (AOPs) and process engineering of suitable photoreactors. The author presents various real-world examples, including economic aspects, while many refer