1. Record Nr. UNINA9910688208403321

Titolo	Photocatalysis : fundamentals, materials and potential / / edited by Pierre Pichat
Pubbl/distr/stampa	Basel, Switzerland : , : MDPI, , 2016
ISBN	3-03842-184-7
Descrizione fisica	1 online resource (684 pages) : illustrations
Disciplina	541.395
Soggetti	Photocatalysis
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di contenuto	List of Contributors -- About the Guest Editor -- Preface -- Chapter 1: Fundamentals: Photon Absorption, Active Species, Mechanisms, Reaction Pathways, Efficiency Evaluation -- Terry A. Egerton Feature Article: UV-Absorption-The Primary Process in Photocatalysis and Some Practical Consequences Reprinted from: Molecules 2014, 19(11), 18192-18214 http://www.mdpi.com/1420-3049/19/11/18192 -- Malka Rochkind, Sagi Pasternak and Yaron Paz Review: Using Dyes for Evaluating Photocatalytic Properties: A Critical Review Reprinted from: Molecules 2015, 20(1), 88-110 http://www.mdpi.com/1420-3049/20/1/88 -- Xibin Pang, Chuncheng Chen, Hongwei Ji, Yanke Che, Wanhong Ma and Jincai Zhao Review: Unraveling the Photocatalytic Mechanisms on TiO2 Surfaces Using the Oxygen-18 Isotopic Label Technique -- Reprinted from: Molecules 2014, 19(10), 16291-16311 http://www.mdpi.com/1420-3049/19/10/16291 -- Yoshio Nosaka, Masami Nishikawa and Atsuko Y. Nosaka Review: Spectroscopic Investigation of the Mechanism of Photocatalysis Reprinted from: Molecules 2014, 19(11), 18248-18267 http://www.mdpi.com/1420-3049/19/11/18248 -- Dana Dvoranova, Zuzana Barbierikova and Vlasta Brezova Article: Radical Intermediates in Photoinduced Reactions on TiO2 (An EPR Spin Trapping Study) Reprinted from: Molecules 2014, 19(11), 17279-17304 http://www.mdpi.com/1420-3049/19/11/17279 -- Kaustava Bhattacharyya, Weiqiang Wu, Eric Weitz, Baiju K. Vijayan and Kimberly A. Gray Article: Probing Water and CO2 Interactions at the Surface of Collapsed Titania Nanotubes Using IR

Spectroscopy Reprinted from: Molecules 2015, 20(9), 15469-15487 http://www.mdpi.com/1420-3049/20/9/15469 -- Chapter 2: UV and Visible-Light Sensitive Photocatalysts: Efficiency Effects of Nature, Composition, Preparation, Structure and Texture Peter J. Kelly, Glen T. West, Marina Ratova, Leanne Fisher, Soheyla Ostovarpour and Joanna Verran Feature Article: Structural Formation and Photocatalytic Activity of Magnetron Sputtered Titania and Doped-Titania Coatings Reprinted from: Molecules 2014, 19(10), 16327-16348 http://www.mdpi.com/1420-3049/19/10/16327 -- Pierre Pichat Review: Are TiO2 Nanotubes Worth Using in Photocatalytic Purification of Air and Water? Reprinted from: Molecules 2014, 19(9), 15075-15087 http://www.mdpi.com/1420-3049/19/9/15075 -- Article: Influence of Post-Treatment Operations on Structural Properties and Photocatalytic Activity of Octahedral Anatase Titania Particles Prepared by Zhishun Wei, Ewa Kowalska and Bunsho Ohtani an Ultrasonication-Hydrothermal Reaction Reprinted from: Molecules 2014, 19(12), 19573-19587 http://www.mdpi.com/1420-3049/19/12/19573 -- Takashi Kamegawa, Yasushi Ishiguro, Ryota Kido and Hiromi Yamashita Article: Design of Composite Photocatalyst of TiO2 and Y-Zeolite for Degradation of 2-Propanol in the Gas Phase under UV and Visible Light Irradiation Reprinted from: Molecules 2014, 19(10), 16477-16488 http://www.mdpi.com/1420-3049/19/10/16477 -- Dmitry Selishchev and Denis Kozlov Article: Photocatalytic Oxidation of Diethyl Sulfide Vapor over TiO2-Based Composite Photocatalysts Reprinted from: Molecules 2014, 19(12), 21424-21441 http://www.mdpi.com/1420-3049/19/12/21424 -- Atsuo Yasumori, Sayaka Yanagida and Jun Sawada Article: Preparation of a Titania/X-Zeolite/Porous Glass Composite Photocatalyst Using Hydrothermal and Drop Coating Processes Reprinted from: Molecules 2015, 20(2), 2349-2363 http://www.mdpi.com/1420-3049/20/2/2349 -- Cooper Langford, Maryam Izadifard, Emad Radwan and Gopal Achari Article: Some Observations on the Development of Superior Photocatalytic Systems for Transfer Mechanisms Application to Water Purification by the "Adsorb and Shuttle" or the Interphase Charge Reprinted from: Molecules 2014, 19(12), 19557-19572 http://www.mdpi.com/1420-3049/19/12/19557 -- Sifani Zavahir and Huaiyong Zhu Article: Visible Light Induced Green Transformation of Primary Amines to Imines Using a Silicate Supported Anatase Photocatalyst Reprinted from: Molecules 2015, 20(2), 1941-1954 http://www.mdpi.com/1420-3049/20/2/1941 -- Pushkar Kanhere and Zhong Chen Review: A Review on Visible Light Active Perovskite-Based Photocatalysts Reprinted from: Molecules 2014, 19(12), 19995-20022 http://www.mdpi.com/1420-3049/19/12/19995 -- Yossy Wicaksana, Sanly Liu, Jason Scott and Rose Amal Article: Tungsten Trioxide as a Visible Light Photocatalyst for Volatile Organic Carbon Removal Reprinted from: Molecules 2014, 19(11), 17747-17762 http://www.mdpi.com/1420-3049/19/11/17747 -- Beata Bajorowicz, Anna Cybula, Michal J. Winiarski, Tomasz Klimczuk and Adriana Zaleska Article: Surface Properties and Photocatalytic Activity of KTaO3, CdS, MoS2 Semiconductors and Their Binary and Ternary Semiconductor Composites Reprinted from: Molecules 2014, 19(9), 15339-15360http://www.mdpi.com/1420-3049/19/9/15339 -- Chapter 3: Air, Water and Surface Decontamination -- Stephen O. Hay, Timothy Obee, Zhu Luo, Ting Jiang, Yongtao Meng, Junkai He, Steven C. Murphy and Steven Suib Feature Article: The Viability of Photocatalysis for Air Purification Reprinted from: Molecules 2015, 20(1), 1319-1356 http://www.mdpi.com/1420-3049/20/1/1319 -- Jaime Gimenez, Bernardi Bayarri, Oscar Gonzalez, Sixto Malato, Jose Peral and Santiago Esplugas Article: A

Comparison of the Environmental Impact of Different AOPS: Risk Indexes Reprinted from: Molecules 2015, 20(1), 503-518 http://www.mdpi.com/1420-3049/20/1/503 -- John Anthony Byrne, Patrick Stuart Morris Dunlop, Jeremy William John Hamilton, Pilar Fernandez-Ibanez, Inmaculada Polo-Lopez, Preetam Kumar Sharma and Ashlene Sarah Margaret Vennard Review: A Review of Heterogeneous Photocatalysis for Water and Surface Disinfection Reprinted from: Molecules 2015, 20 (4), 5574-5615 http://www.mdpi.com/1420-3049/20/4/5574 -- Satoshi Horikoshi and Nick Serpone Review: Coupled Microwave/Photoassisted Methods for Environmental Remediation Reprinted from: Molecules 2014, 19(11), 18102-18128 http://www.mdpi.com/1420-3049/19/11/18102 -- Nobuaki Negishi and Taizo Sano Article: Photocatalytic Solar Tower Reactor for the Elimination of a Low Concentration of VOCs Reprinted from: Molecules 2014, 19(10), 16624-16639 http://www.mdpi.com/1420-3049/19/10/16624 -- Tsuyoshi Ochiai, Erina Ichihashi, Naoki Nishida, Tadashi Machida, Yoshitsugu Uchida, Yuji Hayashi, Yuko Morito and Akira Fujishima Article: Field Performance Test of an Air-Cleaner with Photocatalysis-Plasma Synergistic Reactors for Practical and Long-Term Use Reprinted from: Molecules 2014, 19(11), 17424-17434 http://www.mdpi.com/1420-3049/19/11/17424 -- Shan Zheng, Wenjun Jiang, Mamun Rashid, Yong Cai, Dionysios D. Dionysiou and Kevin E. O'Shea Article: Selective Reduction of Cr(VI) in Chromium, Copper and Arsenic (CCA) Mixed Waste Streams Using UV/TiO2 Photocatalysis Reprinted from: Molecules 2015, 20(2), 2622-2635 http://www.mdpi.com/1420-3049/20/2/2622 -- Jose Colina-Marquez, Fiderman Machuca-Martinez and Gianluca Li Puma Article: Modeling the Photocatalytic Mineralization in Water of Commercial Formulation of Estrogens 17-? Estradiol (E2) and Nomegestrol Acetate in Contraceptive Pills in a Solar Powered Compound Parabolic Collector Reprinted from: Molecules 2015, 20(7), 13354-13373 http://www.mdpi.com/1420-3049/20/7/13354 -- Chapter 4: Photocatalysis and Photoelectrochemistry for Production of Energy and Chemicals -- James Highfield Feature Article: Advances and Recent Trends in Heterogeneous Photo(Electro)-Catalysis for Solar Fuels and Chemicals Reprinted from: Molecules 2015, 20(4), 6739-6793 http://www.mdpi.com/1420-3049/20/4/6739 -- Davide Ravelli, Stefano Protti and Angelo Albini Feature Article: Energy and Molecules from Photochemical/Photocatalytic Reactions An Overview Reprinted from: Molecules 2015, 20(1), 1527-1542 http://www.mdpi.com/1420-3049/20/1/1527 -- Sylwia Mozia, Aleksandra Kulagowska and Antoni W.
Morawski Article: Formation of Combustible Hydrocarbons and H2 during Photocatalytic Decomposition of Various Organic Compounds under Aerated and Deaerated Conditions Reprinted from: Molecules 2014, 19(12), 19633-19647 http://www.mdpi.com/1420-3049/19/12/19633 -- Robert Michal, Stavroula Sfaelou and Panagiotis Lianos Article: Photocatalysis for Renewable Energy Production Using PhotoFuelCells Reprinted from: Molecules 2014, 19(12), 19732-19750 http://www.mdpi.com/1420-3049/19/12/19732 -- Josef Krysa, Martin Zlamal, Stepan Kment, Michaela Brunclikova and Zdenek Hubicka Article: TiO2 and Fe2O3 Films for Photoelectrochemical Water Splitting Reprinted from: Molecules 2015, 20(1), 1046-1058 http://www.mdpi.com/1420-3049/20/1/1046 -- Shozo Yanagida, Susumu Yanagisawa, Koichi Yamashita, Ryota Jono and Hiroshi Segawa Article: Theoretical Verification of Photoelectrochemical Water Oxidation Using Nanocrystalline TiO2 Electrodes Reprinted from: Molecules 2015, 20(6), 9732-9744 http://www.mdpi.com/1420-3049/20/6/9732.

Sommario/riassunto

The field of heterogeneous photocatalysis has given rise to thousands of papers, typically dispersed across many journals. Consequently, from time to time, there is a need for a book providing information concerning the different facets of this field in a handy way. Actually, the present book includes both retrospective analyses and suitable examples of diverse aspects of the current research. It thus covers several basic aspects (photon absorption, active species/mechanisms/reaction pathways, efficiency evaluation), information on UV and visible-light sensitive photocatalysts and the relationship between their characteristics and the photocatalytic efficiency, critical reviews and articles on the potential of photocatalysis (and photoelectrochemistry) for decontamination (of air, water and surfaces) and for the production of energy and chemicals. The contributions have been written by well-known authors forming an ensemble whose excellence has rarely been matched in previous books on this topic.