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Green chemistry has helped in the development of alternative green and biodegradable chemicals usable as wetting, washing, and finishing agents. Much more reactive and biodegradable dyes have been developed for effective dyeing processing to minimize the amount of unfixed dyes in wastewater. Ionic liquids have been developed as alternative medium to replace water consumption in wet processing ...

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The use of synthetic chemical dyes in various industrial processes, including paper and pulp manufacturing, plastics, dyeing of cloth, leather treatment and printing, has increased considerably over the last few years, resulting in the release of dye-containing industrial effluents into the soil and aquatic ecosystems. The textile industry generates high-polluting wastewaters and their ...

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Green chemistry for dyes removal from waste water Green chemistry for dyes removal from waste water Garg, Vinod K. 2015-12-01 00:00:00 Green Process Synth 2015; 4: 507508 Book review DOI 10.1515/gps-2015-0083 Sanjay K. Sharma (Ed.) John Wiley & Sons, 2015 Hardcover, 496 pp. Print ISBN: 978-1-118-72099-8 Dyes are used in large quantities in various industries including textiles, healthcare ...

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Discussed are various promising techniques to remove dyes, including the use of nanotechnology, ultrasound, microwave, catalysts, biosorption, enzymatic treatments, advanced oxidation processes, etc., all of which are "green." Green Chemistry for Dyes Removal from Wastewater comprehensively discusses:

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Victória H. Vargas, Rafael R. Paveglio, Paola de Souza Pauletto, Nina Paula Gonçalves Salau, L. Guilherme Dotto, Sisal fiber as an alternative and cost-effective adsorbent for the removal of methylene blue and reactive black 5 dyes from aqueous solutions, Chemical Engineering Communications, 10.1080/00986445.2019.1605362, 207, 4, (523-536 ...

The use of synthetic chemical dyes in various industrial processes, including paper and pulp manufacturing, plastics, dyeing of cloth, leather treatment and printing, has increased considerably over the last few years, resulting in the release of dye-containing industrial effluents into the soil and aquatic ecosystems. The textile industry generates high-polluting wastewaters and their treatment is a very serious problem due to high total dissolved solids (TDS), presence of toxic heavy metals, and the non-biodegradable nature of the dyestuffs in the effluent. The chapters in this book provide an overview of the problem and its solution from different angles. These problems and solutions are presented in a genuinely holistic way by world-renowned researchers. Discussed are various promising techniques to remove dyes, including the use of nanotechnology, ultrasound, microwave, catalysts, biosorption, enzymatic treatments, advanced oxidation processes, etc., all of which are "green." Green Chemistry for Dyes Removal from Wastewater comprehensively discusses: Different types of dyes, their working and methodologies and various physical, chemical and biological treatment methods employed Application of advanced oxidation processes (AOPs) in dye removal whereby highly reactive hydroxyl radicals are generated chemically, photochemically

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and/or by radiolytic/ sonolytic means. The potential of ultrasound as an AOP is discussed as well. Nanotechnology in the treatment of dye removal types of adsorbents for removal of toxic pollutants from aquatic systems Photocatalytic oxidation process for dye degradation under both UV and visible light, application of solar light and solar photoreactor in dye degradation

In the last two decades the EPA and other national and international agencies have placed increasingly strict regulations on the manufacture and use of synthetic colorants. The pigment and dye industry has had to develop the technology necessary to analyze and remediate pollutants in wastewater. Although these efforts have produced a considerable volume of information, until now, no single book has provided an organized, comprehensive treatment of the environmental chemistry of synthetic colorants. Environmental Chemistry of Dyes and Pigments is the first comprehensive reference to address the environmental problems posed by synthetic colorants, and to provide a forum for the solutions proposed by industry, government, and academia. Focusing on developments in the field over the past two decades, it deals with all aspects of colored wastewater treatment, the disposal of dyes, analytical methods, toxicity, and regulatory questions. In its coverage of wastewater treatment, this book addresses both the most commonly used methods and those specifically designed to address pollution problems at the source by analyzing for and removing dyes and pollutants from wastewater effluent. Throughout, real-world data on a wide variety of dyes and dye intermediates is provided, as well as cost-effective strategies for dealing with wastewater treatment. In addition, several chapters are devoted to the perspectives of national and international experts on regulations governing the manufacture, handling, use, and disposal of synthetic dyes and pigments. The impact these regulations have had on both U.S. and foreign industry is also discussed. A complete, comprehensive, and up-to-date guide to pollution prevention in the dyestuff and textile industries Environmental Chemistry of Dyes and Pigments is the only self-contained volume that focuses on the environmental impact of synthetic dyes and pigments. Contributions by international experts from industry, academia, and government make this an indispensable book for anyone dealing with the environmental problems posed by synthetic colorants. It covers the entire range of environmental issues, from waste treatment and analysis to pollution prevention and government regulations. Covers the latest wastewater treatment methods Shows how to use recycling and reusing methods effectively, while cutting production costs Describes state-of-the-art technology, including the PACT(r) system Explains analysis techniques, including spectrometry and ionization Covers legislative issues and the regulatory status of various compounds in both the United States and abroad Examines the various pollution prevention programs instituted by government and industry Bridging the gap between industrial interests and environmental concerns, Environmental Chemistry of Dyes and Pigments stands as an invaluable resource for

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scientists, researchers, and engineers in the textile and dyestuff industries, and in the environmental sciences. It is also an extremely useful text for environmental science students.

This book describes the various advanced treatment methods for removal of multiple types of dyes from effluent stream. It pays particular attention to the economic aspects of treatment of textile waste-water. The different technologies illustrated in the book include adsorption, nanofiltration, advanced oxidation, micellar enhanced ultrafiltration, cloud-point extraction, and electrocoagulation. The book presents in-depth analyses of the removal mechanisms and performance optimization of the processes involved therein. This book will be useful to chemists, chemical engineers, environmental engineers, and health and pollution control professionals. The contents have been presented in a manner that they can be easily understood and applied by a wide variety of readers including researchers, students, and practicing engineers.

The Impact and Prospects of Green Chemistry for Textile Technology provides a review and summary of the role of green chemistry in textiles, including the use of green agents and sustainable technologies in different textile applications. The book systematically covers the history and chemistry of eco-friendly colorants, chitin, chitosan, cyclodextrin, biomordants, antimicrobial, UV protective, flame retardant, insect repellent textiles, and advanced pre- and post-treatment technologies, such as the sonochemistry and plasma methods currently employed in functional modifications. The book also pays attention to the remediation of textile effluents using novel, sustainable and inexpensive adsorbents. Written by high profile contributors with many years of experience in textile technology, the book gives engineers and materials scientists in the textile industry the information they need to effectively deploy these green technologies and processes. Introduces green chemistry and sustainable technologies, and explores their role in different textile applications Examines the use of renewable materials, such as biopolymers, dyes and pigments, biomordants, polyphenols and plant extracts in functional finishing applications Deals the functional modification of textiles using state-of-the-art biotechnology and nanotechnology

This is the first volume on adsorption using green adsorbents and is written by international contributors who are the leading experts in the adsorption field. The first volume provides an overview of fundamentals and design of adsorption processes. For people who are new to the field, the book starts by two overview chapters presenting the principles and properties of wastewater treatment and adsorption processes. The book also provides a comprehensive source of knowledge on acid-base properties of biosorbents. It discusses fractal-like

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kinetic models for fluid-solid adsorption, reports on the chemical characterization of oxidized activated carbons for metal removal, and the use of magnetic biosorbents in water treatment. Furthermore, the thermodynamic properties of metals adsorption by green adsorbents, and biosorption of polycyclic aromatic hydrocarbons and organic pollutants are reviewed, and finally the recent trends and impact of nanomaterials as green adsorbent and potential catalysts for environmental applications are summarized. The audience for this book includes students, environmentalists, engineers, water scientists, civil and industrial personnel who wish to specialize in adsorption technology. Academically, this book will be of use to students in chemical and environmental engineering who wish to learn about adsorption and its fundamentals. It has also been compiled for practicing engineers who wish to know about recent developments on adsorbent materials in order to promote further research toward improving and developing newer adsorbents and processes for the efficient removal of pollutants from industrial effluents. It is hoped that the book will serve as a readable and useful presentation not only for undergraduate and postgraduate students but also for the water scientists and engineers and as a convenient reference handbook in the form of numerous recent examples and appended information.

Urbanization, industrialization, and unethical agricultural practices have considerably negative effects on the environment, flora, fauna, and the health and safety of humanity. Over the last decade, green chemistry research has focused on discovering and utilizing safer, more environmentally friendly processes to synthesize products like organic compounds, inorganic compounds, medicines, proteins, enzymes, and food supplements. These green processes exist in other interdisciplinary fields of science and technology, like chemistry, physics, biology, and biotechnology, Still the majority of processes in these fields use and generate toxic raw materials, resulting in techniques and byproducts which damage the environment. Green chemistry principles, alternatively, consider preventing waste generation altogether, the atom economy, using less toxic raw materials and solvents, and opting for reducing environmentally damaging byproducts through energy efficiency. Green chemistry is, therefore, the most important field relating to the sustainable development of resources without harmfully impacting the environment. This book provides in-depth research on the use of green chemistry principles for a number of applications.

This book reviews health hazards associated with wastewater use and water pollutants. Chapters present applications of green materials made of agricultural waste, activated carbon and magnetic materials for wastewater treatment. The removal of toxic metals using algal biomass and the removal of toxic dyes using chitosan composite materials are also discussed. The book includes reviews on the removal of phenols, pesticides, and on the use of ionic liquid-modified activated carbon for the treatment of textile wastewater.

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This book highlights the potential and scope of green chemistry for clean and sustainable development. Covering the basics, the book introduces readers to the need and the many applications and benefits and advantages of environmentally friendly chemical practice and application in industry. The book addresses such topics as ecologically safe products, catalysts and solvents, conditions needed to produce such products, types of chemical processes that are conducive to green chemistry, and much more.

Inadequate access to clean water afflicts people throughout the world, and in developing countries any solution to this challenge must be achieved at a low cost and low energy demand. At the same time, the use of chemicals, and subsequent environmental impact must also be reduced. Green and sustainable water remediation is a rapidly growing field of interest to governments and corporations alike, with considerable input from academics, environmental consultants and public interest groups. This book presents a focused set of articles covering a range of topics in the field, examining not only the adoption of natural products for water remediation, but also the synthesis of new materials and emerging clean technologies. Contributors from across the globe (including some "on the ground" in the developing world) present a comprehensive digest in the form of review-style articles highlighting the current thinking and direction in the field. Interested stakeholders from all sectors will find this book invaluable, and postgraduate students of chemical engineering or environmental science will benefit from the real-world applications presented.

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