



# Green Chemistry for Sustainable Water Purification

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## DESCRIPTION

### GREEN CHEMISTRY for Sustainable Water Purification

*Green Chemistry for Sustainable Water Purification* provides systematic coverage of the most recent research and development in clean water treatment technologies based on green materials and nanocomposites.

Providing safe drinking water is one of the top priorities for scientists and industrialists working on projects, and one particular problem is the contamination of groundwater with toxic organic and inorganic compounds released by various industries. The presence of contaminants or industrial effluents in drinking water systems has increasingly become a major environmental challenge. To address the problem, several methods, including ion exchange, membrane filtration, advanced oxidation, biological degradation, photocatalytic degradation, electro-coagulation, and adsorption, are in operation for removing or minimizing these wastes. The purification process of wastewater using conventional methods, however, has proved to be markedly ineffective, very difficult, and highly expensive.

On the other hand, for the remediation of water resources, a concept like green chemistry, based on the application of biological agents including polymers, bacteria, and fungi, has received great scientific attention as it helps to avoid the toxic by-products of conventional techniques and enhances eco-friendly wastewater treatment approaches.

This book discusses the different treatment technologies with a special focus on the green adsorption approach, using biological and hybrid biochemical treatment technologies to prevent water contamination and maintain the ecosystem. It discusses the analysis of organic and inorganic pollutants from industrial wastewater. It also focuses on the removal and recovery of organic and inorganic contaminants from the environment and several case studies describing the removal and recovery of environmental pollutants using

green technology are given. The recycling of low-cost along with green adsorbent technology is explained in detail. Finally, the book highlights treatment technologies with effective pollutant removal capacities that are used in modern water treatment units.

## **Audience**

The book will serve as an important resource for materials scientists, chemists, chemical engineers, biotechnologists, textile engineers and environmental scientists. It will also be valuable to industrial organizations, consulting engineering companies, etc. for the selection and implementation of the most sustainable wastewater treatment technologies.

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## **ABOUT THE AUTHOR**

**Shahid-ul-Islam, PhD**, is a Research Scientist at the Department of Textile & Fiber Engineering, Indian Institute of Technology Delhi (IIT). His area of interests are antimicrobial coatings, green chemistry, fibers & polymers, polymeric composites and nanocomposites and nano-biotechnology. He has published numerous peer-reviewed research articles in journals of high repute including contributions to several internationally recognized books published by the Wiley-Scrivener imprint, Springer, and Elsevier.

**Aabid Hussain Shalla, PhD**, is an associate professor in the Department of Chemistry at Islamic University of Science and Technology, J&K, India. He has more than 35 publications in international journals, three books, and many book chapters to his credit. His research interests include the synthesis of hybrid ion exchange materials/ion-selective electrodes/synthesis of smart responsive hydrogels to envisage their application in the removal and identification of toxic heavy metal ions, dyes, and polyaromatic hydrocarbons (PAHs) in wastewaters.

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