New Book Announcement

**Novel Water Treatment and Separation Methods**

Simulation of Chemical Processes

Editors: Bharat A. Bhanvase, PhD
Associate Professor, Chemical Engineering Department, Laxminarayan Institute of Technology, RTM Nagpur University, Nagpur, Maharashtra, India

Rajendra P. Ugwekar, PhD
Associate Professor, Chemical Engineering Department, Laxminarayan Institute of Technology, RTM Nagpur University, Nagpur, Maharashtra, India

Raju B. Mankar
Director, Laxminarayan Institute of Technology, Nagpur, India; Ex-Vice-Chancellor, Dr. BabasahebAmbedkar Technological University, Lonere-Raigad, India

Due to increasing demand for potable and irrigation water, new scientific research is being conducted to deal with wastewater from a variety of sources. **Novel Water Treatment and Separation Methods: Simulation of Chemical Processes** presents a selection of research related to applications of chemical processes for wastewater treatment, separation techniques, and modeling and simulation of chemical processes. Among the many topics are:

- degradation of herbicide
- removal of anionic dye
- efficient sun-light driven photocatalysis
- removal of copper and iron using green activated carbon
- defluoridation of drinking water
- removal of calcium and magnesium from wastewater using ion exchange resins
- degradation of vegetable oil refinery wastewater
- novel separation techniques, including microwave-assisted extraction and more

The volume presents selected examples in wastewater treatment, highlighting some recent examples of processes such as photocatalytic degradation, emulsion liquid membrane, novel photocatalyst for degradation of various pollutants, and adsorption of heavy metals. The book goes on to explore some novel separation techniques, such as microwave-assisted extraction, anhydrous ethanol through molecular sieve dehydration, batch extraction from leaves of Syzygium cumini (known as jambul, jambolan, jamblang or jamun), and reactive extraction. These novel separation techniques have proved to be advantageous over conventional methods.

The volume also looks at modeling and simulation of chemical processes, including chapters on flow characteristics of novel solid-liquid multistage circulating fluidized bed, mathematical modeling and simulation of gasketed plate heat exchangers, optimization of the adsorption capacity of prepared activated carbon, and modeling of ethanol/water separation by pervaporation, along with topics on simulation using CHEMCAD software.

This volume will be very valuable to food science engineers and researchers as well as to faculty and students in food science and engineering.

REVIEWS

“Brings out important information on various aspects of water treatment technologies. With the increase in global population, water has now been a primary focus for geopolitics in water-starved nations. It is important, therefore, to preserve, recycle, and reuse water. The book provides insights into the importance of water and various methods of water treatment... In the initial sections of the book, details on various techniques for water treatment have been provided. Subsequently, the book deals with novel separation processes and modeling and simulation of various chemical processes involved in water treatment technologies. I strongly feel that the book provides a complete package for researchers and practicing engineers working in the field of water treatment technologies.” —Dr. Jitendra Sangwai, Indian Institute of Technology Madras, Chennai, India

CONTENTS

Preface

**PART I: MODERN TECHNIQUES IN WATER TREATMENT**

   V. Sakalkar, A. Khandare, M. P. Desosarkar, and S. P. Kamble

2. Studies on Removal of Anionic Dye Using Emulsion Liquid Membrane
   R. Kankate, S. Ghodke, and S. Sonawane

3. Zinc Oxide Microarchitectures with Exposed Crystal Face for Enhanced Photocatalytic Activity
   S. P. Chaudhari, S. P. Meshram, P. D. Jolhe, G. N. Chaudhari, and A. B. Bodade

4. Sonochemical Synthesis of Mg-Doped ZnO NPs for Efficient Sun-Light Driven Photocatalysis

5. Intensified Removal of Cu2+ and Fe2+ Using Green Activated Carbon Derived from Lantana camara Stem and Soya Hull and Its Comparison with Commercial Activated Carbon
   A. A. Kada, B. A. Bhanvase, and S. H. Sonawane

6. Defluoridation of Drinking Water Using Fe-Al Mixed Metal Hydroxides
   Drupti Telang, M. P. Desosarkar, S. P. Kamble, and Rohit Shetty

7. Adsorption of Hexavalent Chromium by Using Sweetlime and Orange Peel Powder
   N. M. Rane, S. P. Shevale, S. V. Admane, and R. S. Sapkal

8. Investigation on Elimination of Cr (VI) from Waste Water by Powdered Shell of Peas as Adsorbent
   V. S. Wadgaonkar and R. P. Ugwekar

9. Removal of Calcium and Magnesium from Wastewater Using Ion Exchange Resins
   V. D. Pakhale and P. R. Gogate

Contents continued on side 2