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# **Magnetic MXenes and their Nanocomposites for Wastewater Remediation**



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**Editors Book Series ID:  
IIPER1702532241**



**Iterative International Publishers:**  
Novi, Michigan, USA  
Chikkamagaluru, Karnataka, India

**Imprint IIP**  
Registered publisher under Raja Rammohun Roy  
Agency, Government of India and also under  
Bowker My identifiers agency, USA

**Important Dates:**  
Chapter/paper submission starts on: Jan. 1, 2024  
Last date for chapter/paper submission: Mar. 1, 2024  
Acceptance notification: Apr. 1, 2024  
Last date for registration: Apr. 20, 2024

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Call for Chapters

# Magnetic MXenes and their Nanocomposites for Wastewater Remediation

## Aims and Scope:

The proposed book aims to comprehensively explore the diverse applications and advancements of Magnetic MXenes and their nanocomposites in water treatment technologies. By integrating fundamental principles with cutting-edge research, the book aims to bridge the gap between theoretical understanding and practical implementation, making it a valuable resource for researchers, academics, and professionals in the field.

## Book Chapters Contents:

### 1. Introduction to Mxene-Magnetic Nanocomposites:

- 1.1 Overview of Nanomaterials
- 1.2 Fundamental Properties of Mxene
- 1.3 Synthesis and Characterization of Magnetic-Mxene Nanocomposites
- 1.4 Overview of Applications and its Challenges and Limitations
- 1.5 Environmental Significance

### 2. Magnetic-Mxene Nanocomposites in Adsorption Technologies:

- 2.1 Adsorption Mechanisms
- 2.2 Target Contaminants for Adsorption
- 2.3 Heavy Metal Removal using Magnetic-Mxene Nanocomposites
- 2.4 Organic Pollutant Adsorption
- 2.5 Advances in Adsorption Technology

### 3. Magnetic-Mxene Nanocomposites for Catalytic Water Treatment:

- 3.1 Catalytic Properties of Mxene
- 3.2 Types of Catalytic Reactions
- 3.3 Synergistic Effects with Magnetic Properties
- 3.4 Applications of Advanced Oxidation Processes
- 3.5 Photocatalysis Applications
- 3.6 Heterogeneous Catalysis
- 3.7 Future Directions in Catalytic Technologies

### 4. Magnetic-Mxene-Based Membrane Technologies:

- 4.1 Membrane Fabrication Techniques
- 4.2 Design of Magnetic-Mxene Hybrid Membranes
- 4.3 Separation Mechanisms
- 4.4 Filtration and Pervaporation Applications
- 4.5 Membrane Performance Metrics
- 4.6 Challenges and Innovations in Membrane Design

### 5. Environmental Impacts and Safety Considerations:

- 5.1 Life Cycle Assessment of Magnetic-Mxene Nanocomposites
- 5.2 Ecotoxicity Studies
- 5.3 Health and Safety Considerations
- 5.4 Regulatory Compliance
- 5.5 Risk Assessment and Management
- 5.6 Environmental Monitoring and Reporting

### 6. Future Perspectives and Emerging Trends:

- 6.1 Ongoing Research and Development
- 6.2 Innovations in Synthesis Techniques
- 6.3 Collaborative Interdisciplinary Research
- 6.4 Policy and Funding Implications
- 6.5 Ethical Considerations in Technology Development
- 6.6 Sustainable Nanotechnology Futures

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