

**Age of MXenes, Volume 4.**  
**Applications in Advanced Catalysis**  
**and Membrane Processes**

The paper used in this publication meets the minimum requirements of American National Standard for Information Sciences—Permanence of Paper for Printed Library Materials, ANSI Z39.48-1984. | ISBN 9781713888512 (pod)

Copyright © 2023 American Chemical Society

All Rights Reserved. Reprographic copying beyond that permitted by Sections 107 or 108 of the U.S. Copyright Act is allowed for internal use only, provided that a per-chapter fee of \$40.25 plus \$0.75 per page is paid to the Copyright Clearance Center, Inc., 222 Rosewood Drive, Danvers, MA 01923, USA. Republication or reproduction for sale of pages in this book is permitted only under license from ACS. Direct these and other permission requests to ACS Copyright Office, Publications Division, 1155 16th Street, N.W., Washington, DC 20036.

The citation of trade names and/or names of manufacturers in this publication is not to be construed as an endorsement or as approval by ACS of the commercial products or services referenced herein; nor should the mere reference herein to any drawing, specification, chemical process, or other data be regarded as a license or as a conveyance of any right or permission to the holder, reader, or any other person or corporation, to manufacture, reproduce, use, or sell any patented invention or copyrighted work that may in any way be related thereto. Registered names, trademarks, etc., used in this publication, even without specific indication thereof, are not to be considered unprotected by law.

PRINTED IN THE UNITED STATES OF AMERICA

# Contents

<b>Preface</b> .....	<b>ix</b>
<b>1. 2D-Transition Metal Carbides and Nitrides: Prospects and Challenges</b> .....	<b>1</b>
Abhishek Kagalkar, Swapnil Dharaskar, and Nitin Chaudhari	
<b>2. 2D MXenes: A Promising Functionality as an Electrocatalyst</b> .....	<b>43</b>
Manish Chauhan, Shiv Singh, and Pradip Kumar	
<b>3. An Extensive Review on MXenes as Emergent Photovoltaic Materials</b> .....	<b>59</b>
Deepthi Jayan K.	
<b>4. Solar-to-Fuel Conversion: Application of Two-Dimensional <math>Ti_3C_2T_x</math> MXene as Cocatalyst</b> .....	<b>83</b>
Esther Dimngaihvungi, Manjeet Singh, Balaram Pani, and Ashish Kumar Singh	
<b>5. Role of MXene as a Catalyst for Hydrogen Synthesis</b> .....	<b>105</b>
Bhavana Shanmughan and Balasubramanian Kandasubramanian	
<b>6. MXenes in Membrane-Based Water Treatment Applications</b> .....	<b>121</b>
Mohammed Kadhom	
<b>7. The Flourishing Application of MXenes for Dielectric-Based Microwave Absorption</b> . 141	
Zhiyuan Fan and Hongtao Guan	
<b>Editors' Biographies</b> .....	<b>177</b>

## Indexes

<b>Author Index</b> .....	<b>181</b>
<b>Subject Index</b> .....	<b>183</b>