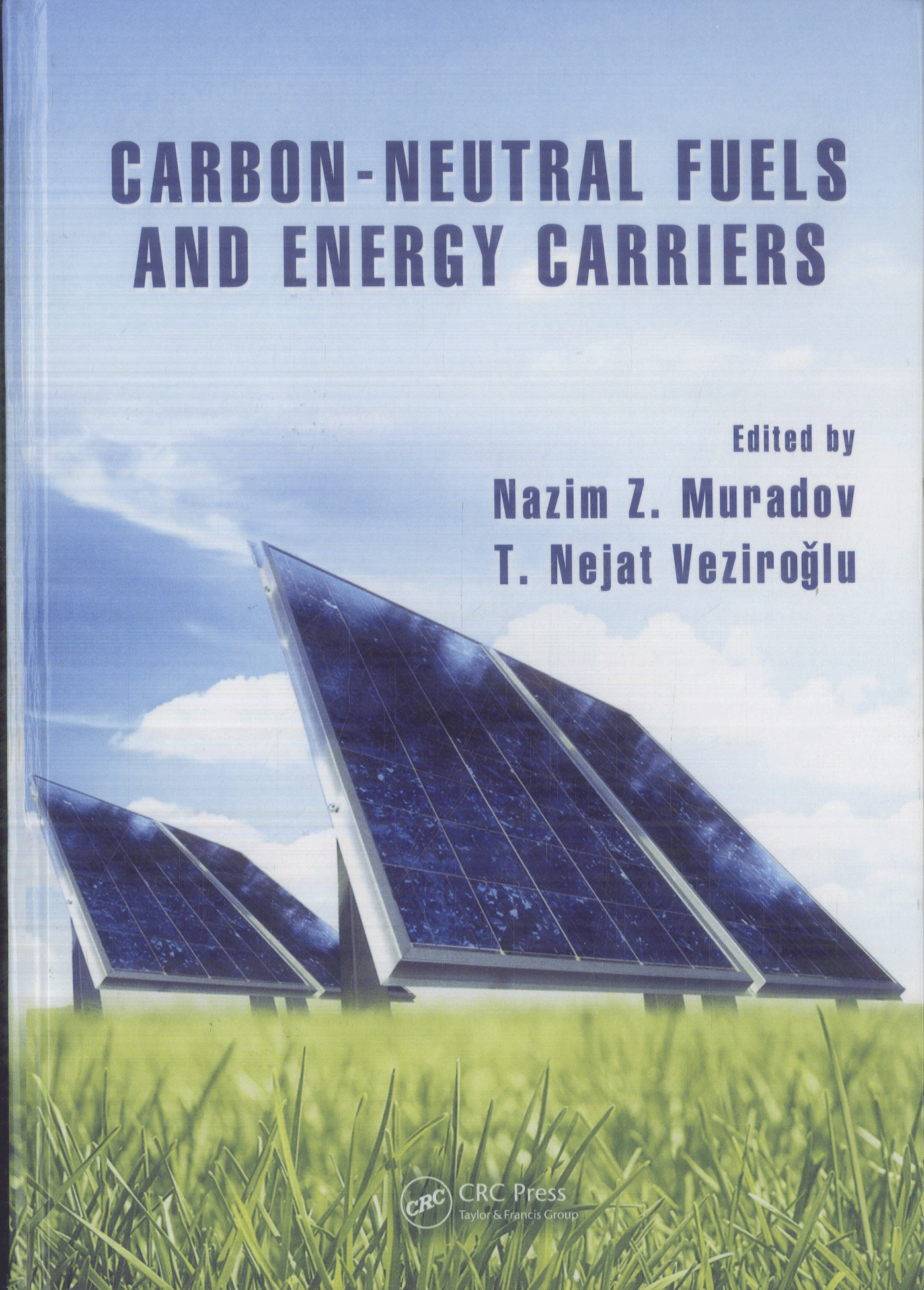


CARBON-NEUTRAL FUELS AND ENERGY CARRIERS

Edited by

Nazim Z. Muradov

T. Nejat Veziroğlu



CRC Press
Taylor & Francis Group

Contents

Preface.....	vii
Green Chemistry and Chemical Engineering	xi
Editors.....	xiii
Chapter Lead Contributors.....	xv
1 Energy Options in a Carbon-Constrained World: An Advent of Carbon-Neutral Technologies	1
<i>Nazim Z. Muradov and T. Nejat Veziroğlu</i>	
2 Hydrogen Energy—Abundant, Efficient, Clean: A Debate over the Energy-System-of-Change.....	115
<i>Carl-Jochen Winter</i>	
3 Nuclear Power for the Production of Carbon-Free Energy and Fuels	203
<i>Kenneth R. Schultz, Maximilian B. Gorensek, J. Stephen Herring, Michele A. Lewis, Robert Moore, James E. O'Brien, Paul S. Pickard, Benjamin E. Russ, and William A. Summers</i>	
4 Solar Production of Fuels from Water and CO₂.....	291
<i>Gabriele Centi, Siglinda Perathoner, Rosalba Passalacqua, and Claudio Ampelli</i>	
5 Efficient Utilization of Solar, Wind, and Geothermal Energy Sources through Exergy Analysis	325
<i>Arif Hepbasli</i>	
6 Electrochemical Reduction of CO₂ to Fuels	363
<i>Serguei N. Lvov, Justin R. Beck, and Mark S. LaBarbera</i>	
7 Energy Storage and Other Ways of Handling Intermittent Energy Production from Renewable Sources.....	401
<i>Bent Sørensen</i>	
8 Energy Bionics: The Bio-Analogue Strategy for a Sustainable Energy Future	415
<i>Helmut Tributsch</i>	
9 Synthetic Hydrocarbon Fuels from Lignocellulosic Biomass	465
<i>Georg Schaub and Kyra Pabst</i>	
10 Fundamentals of Biohydrogen Production Processes.....	491
<i>Chitrlekha Nag Dasgupta and Debabrata Das</i>	
11 Photobiological and Photobiomimetic Production of Solar Fuels	547
<i>Paul W. King, Katherine A. Brown, Kathleen Ratcliff, and Laura L. Beer</i>	

12 Fermentative Biofuels: Prospects of Practical Application	603
<i>David B. Levin, Carlo Carere, Umesh Ramachandran, Tom Rydzak, and Jessica Saunders</i>	
13 Biofuels from Oily Biomass	637
<i>Maximino Manzanera</i>	
14 Fossil Fuel Decarbonization: In the Quest for Clean and Lasting Fossil Energy	667
<i>Nazim Z. Muradov</i>	
15 Clean Car Options for the Twenty-First Century	787
<i>C.E. (Sandy) Thomas</i>	
Index	817