1. Record Nr. UNINA9910812377203321

Titolo	Nanocarbons for advanced energy conversion . Volume 2 / / edited by Xinliang Feng ; contributors, Ermete Antolini [and thirty-two others]
Pubbl/distr/stampa	Weinheim an der Bergstrasse, Germany : , : Wiley-VCH, , 2015 ©2015
ISBN	3-527-68004-7 3-527-68001-2 3-527-68002-0
Descrizione fisica	1 online resource (329 p.)
Collana	Advanced Nanocarbon Materials
Disciplina	621.042
Soggetti	Energy conversion Carbon Nanotechnology
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references at the end of each chapters and index.
Nota di contenuto	Cover; Title Page; Copyright; Contents; List of Contributors; Preface; Chapter 1 Heteroatom-Doped Carbon Nanotubes as Advanced Electrocatalysts for Oxygen Reduction Reaction; 1.1 Introduction; 1.2 Experimental Evaluation of Electrocatalytic Activity toward ORR; 1.3 Doped Carbon Nanotubes for ORR; 1.3.1 Carbon Nanotubes Doped with Nitrogen; 1.3.2 Carbon Nanotubes Doped with Heteroatoms Other Than Nitrogen; 1.4 Conclusions; Acknowledgments; References; Chapter 2 Doped Graphene as Electrocatalysts for Oxygen Reduction Reaction; 2.1 Introduction 2.2 Active Sites and Mechanisms of ORR on Doped Graphene2.2.1 ORR Mechanism on Doped Graphene; 2.2.2 The Active Site of Doped Graphene for ORR; 2.3 Synthesis and Performance of Doped Graphene; 2.3.1 Nitrogen-Doped Graphene; 2.3.2 Synthesis and Performance of Other Heteroatom-Doped Graphene; 2.3.2.1 B-Doped Graphene; 2.3.2.2 S-Doped Graphene; 2.3.2.3 P and Other Heteroatom-Doped Graphene; 2.4 Conclusions and Perspective; References; Chapter 3 Heteroatom-Doped Nanoporous Carbon for Electrocatalysis; 3.1

Introduction; 3.2 Synthesis of Doped Nanoporous Carbons
3.2.1 Synthesis of Heteroatom-Doped Ordered Mesoporous Carbons3.
2.1.1 Self-Assembling of Heteroatom-Rich Carbon Precursors through a Soft-Templating Method; 3.2.1.2 Posttreatment of Ordered Mesoporous Carbon Framework with Heteroatom-Rich Chemicals; 3.2.1.3 Hard-Templating Method with One-Step Doping Using Heteroatom-Rich Carbon Precursors; 3.2.2 Synthesis of Doped Porous Graphene; 3.2.2.1 Vapor-Assisted Method; 3.2.2.2 Liquid-Phase Method; 3.3 Heteroatom-Doped Nanoporous Carbons for Electrocatalysis; 3.3.1 Oxygen Reduction Reaction (ORR); 3.3.2 Doped Ordered Mesoporous Carbon for ORR
3.3.3 Doped Graphene for ORR3.3.3.1 Single Heteroatom-Doped Graphene; 3.3.3.2 Dual-Doped Graphene; 3.3.3.3 Doped Graphene-Based Nanocomposites; 3.3.4 Other Electrochemical Systems; 3.4 Summary and Perspectives; References; Chapter 4 Nanocarbon-Based Nonprecious-Metal Electrocatalysts for Oxygen Reduction in Various Electrolytes; 4.1 Introduction; 4.2 Oxygen Reduction in Acidic Media; 4.2.1 Heat-Treated Macrocyclic Compounds; 4.2.2 Heat-Treated Nonmacrocyclic Catalysts; 4.2.2.1 Nitrogen Precursors; 4.2.2.2 Type of Transition Metals; 4.2.2.3 Effect of Supports; 4.2.2.4 Heating Temperatures
4.2.3 Importance of in situ Formed Graphitic Nanocarbons4.3 Oxygen Reduction in Alkaline Media; 4.3.1 Metal-Free Carbon Catalysts; 4.3.1.1 Nitrogen-Doped Carbon; 4.3.1.2 Boron and Sulfur Doping; 4.3.1.3 Binary and Ternary Dopants; 4.3.2 Heat-Treated M-N-C (M: Fe, Co) Catalysts; 4.3.3 Nanocarbon/Transition Metal Compound Hybrids; 4.4 Oxygen Reduction in Nonaqueous Li-O_2 Batteries; 4.5 Summary and Perspective; Acknowledgments; References; Chapter 5 Spectroscopic Analysis of Nanocarbon-Based non-precious Metal Catalyst for ORR; 5.1 Introduction; 5.2 Raman Spectroscopy; 5.2.1 Theory
5.2.2 Characterization of Me-N-C Catalysts by Raman Spectroscopy

Sommario/riassunto

In this second volume in the first book series on nanocarbons for advanced applications the highly renowned series and volume editor has put together a top author team of internationally acclaimed experts on carbon materials. Divided into three major parts, this reference provides a current overview of the design, synthesis, and characterization of nanocarbons, such as carbon nanotubes, fullerenes, graphenes, and porous carbons for energy conversion applications. It covers such varied topics as electrocatalysts for oxygen reduction reactions in the different types of fuel cells, metal-air bat