World Scientific Series on Carbon Nanoscience

Handbook of Carbon Nano Materials

Volume 2
Electron Transfer and Applications

Editors

Francis D'Souza

Karl M. Kadish

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HANDBOOK OF CARBON NANO MATERIALS

Volume 2

Electron Transfer and Applications

Preface

This *Handbook of Carbon Nanomaterials* celebrates the 25th anniversary of the discovery of Fullerenes, then known as Buckyballs. Since their discovery in 1985, fullerenes as well as carbon nanotubes and graphenes, two closely related carbon allotropes, have taken up a solid place in modern science and technology as evidenced by the awarding of two Nobel Prizes — the first, in Chemistry, was given in 1996 to Robert F. Curl Jr., Sir Harold Kroto and Richard E. Smalley for the discovery of fullerenes and the second, in Physics, was awarded in 2010 to Andre Geim and Konstantin Novoselov for the isolation of graphene using Scotch tape as a tool. Since 1985, more than 100,000 scientific papers have been published on topics devoted to fullerenes, carbon nanotubes and related materials and there is no doubt that these types of carbon nanomaterials, with their unique structures and properties, will continue to find many new applications in all areas of science and technology.

The present *Handbook of Carbon Nanomaterials* consists of 23 chapters in two volumes which, as a whole, summarize current work and the latest developments in the field of carbon nanomaterials as seen through the eyes of more than three dozen leading researchers from around the world. The topics covered in this two volume set of books can be divided into four general areas. The first deals with the chemistry of fullerenes and carbon nanotubes, including organic functionalization, reactivity, perfluoroalkylation and fullerenes linked to photosensitizers. The second covers the chemistry and physics of endohedral fullerenes. The third major area of coverage involves molecular and supramolecular chemistry of fullerenes and carbon nanotubes while the fourth includes topics related to photoinduced energy and electron transfer. Finally, applications of fullerenes, carbon nanotubes and graphenes as applied to organic molecular electronics, polymers composites, thermal conductive materials, photovoltaics and sensing are presented.

This Handbook was written as a hands on reference guide for scientists working in the fields of chemistry, physics, materials science, polymer science, solid-state physics, nanotechnology or supramolecular science. The coverage of topics presented is both in-depth and comprehensive, and when combined with the perspectives for future research given by the contributing authors makes this book an invaluable reference source which should be considered essential reading for both students and advanced researchers in the field.

The editors would like to acknowledge all of the contributors for their timely submission of the state-of-the-art review topics; We also acknowledge NSF, Kansas-EPSCoR, ACS-PRF (to FD) and the Robert A Welch Foundation (to KMK) for financial support; last but not least, the staff of World Scientific Publishing Co are acknowledged for their immense help in bringing out this publication in a timely manner.

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