

<<炭材料科学与工程>>

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内容概要

近年来由于富勒烯和碳纳米管的发现，炭材料研究受到了全球材料科学界、物理界和化学界的广泛关注。

该书系统地介绍了炭材料的科学理论知识和工程应用实例。

第一部分为绪论，介绍了写作本书的目的和炭材料的分类与发展史，以及炭的多样性。

第二部分为炭材料的基础科学知识，主要介绍了炭材料的结构、性能和制备工艺，特别是炭化和石墨化的原理及其微观结构控制技术，多孔炭的孔径控制和炭材料掺杂其他原子的技术，炭材料的各类表征方法。

第三部分主要为炭素材料的工程与应用问题，特别是新型炭材料的发展及其在能源、环保、原子能、国防方面的应用实例，涉及石墨电极，高密度各向同性石墨，高取向热解石墨，玻璃炭，纤维状炭，多孔炭，石墨层间化合物等。

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章节摘录

It has to be pointed out that the authors could not refer to all papers on carbon materials published in huge numbers of journals, and actually the authors did not intend to do so. The authors would like to give an overview on fundamentals of science and engineering of carbon materials from the point of view of structure and texture. If the readers can get a general view on carbon materials and the fundamental concepts to understand and to study the carbon materials, it will be a great pleasure for the authors. In addition, the authors would like to ask all readers that referring to the original papers cited in this book, and also to many related papers, which were not cited in this book, is strongly suggested in order to understand in more details. It has to be emphasized here once more that all published papers are not cited in this book and that even many interesting and important papers are missing here. One carbon material has different aspects. For an example, porous carbons were produced through different processes, from carbonization of thermosetting precursors associated with activation, through the template method without activation, from aerogels, from the carbonization of thermoplastic precursors, through exfoliation of graphite via intercalation compounds, etc.

The porous carbons thus prepared have a wide range of pores from micropores to macropores, and as a consequence are applied in various fields for adsorbents of various molecules, molecular sieving, storage of methane and hydrogen, sorption of viscous heavy oils, electrodes of electric double layer capacitors, etc.

For another example, exfoliated graphite was used as the raw materials for flexible graphite sheets, which were applied in various fields of industries, but it is recently found to be a good sorbent for heavy oils, a support for various catalyst metals, and also a raw material for metal carbides. Because of these reasons, porous carbons and exfoliated graphite are explained in different chapters and sections in the present book. All carbon materials are in exactly the same situation. Therefore, the readers are strongly requested to read through whole parts of the present book first, even though they are interested in a specialized carbon material, then to visit the sections which are written on the specified carbon material, and then the original papers cited and also those not cited in the present book.

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