<<微纳米结构的导电聚合物>>

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前言

A traditional idea is that organic polymer is regarded as an excellent insulatorbecause of its saturated macromolecule. However, a breakthrough of organicpolymer imitating a metal was coming-out in the 1960s——1970s. It implied electronsin polymers need to be free to move and not bound to the atoms. The breakthroughwas realized by awarders of Nobel Chemistry Prizes in 2000, who were AlanJ. Heeger at the University of California at Santa Barbara, USA, AlanG. MacDiarmid at the University of Pennsylvania, Philadelphia, USA, and HidekiShirakawa at the University of Tsukuba, Japan. In 1977, actually, they accidentallydiscovered that room-temperature conductivity of conjugated polyacetylenedoped with iodine was as high as 103 S/cm, which was enhanced by 101~ timescompared with original insulating polyacetylene. The change of the electricalproperties from insulator to conductor was subsequently ascribed to "doping", butcompletely different from the doping concept as applied in inorganic semiconductors.The unexpected discovery not only shattered a traditional idea that organicpolymers are insulators, but also established a new filed of conducting polymersor "synthetic metals".

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内容概要

《微纳米结构的导电聚合物》适合高校和科研院所的化学、化工、物理及材料专业的研究人员、教师和研究生阅读参考。
导电聚合物打破了聚合物为绝缘体的传统观念，因而被称为“第四代聚合物”。
它既具有金属和半导体的导电特性，又保留了聚合物的轻质、柔性和可加工的特色。
这种材料在光电子器件、传感技术、分子电子学和纳米器件以及驱动器件等方面具有潜在的应用前景。
《微纳米结构的导电聚合物》比较完整、系统地介绍了导电聚合物的缘起、掺杂与导电机制、结构与性能、技术应用前景以及研究进展，特别介绍了作者采用无模板自组装方法在微纳米结构的导电聚合物的研究及其应用方面的学术贡献。
《微纳米结构的导电聚合物》的内容分为5章：第1章，导论；第2章，优异的导电聚苯胺；第3章，导电聚合物的物理特性及其应用；第4章，导电聚合物的微纳米结构；第5章，无模板法自组装导电聚合物的微纳米结构。
为了便于读者阅读，作者还特别给出了名词解释。

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书籍目录

章节摘录

Preparation of metal quantum dots has been recently received considerableattention in the field of nano-science and nano-technology owing to their interestingoptical, electrical, and catalytic properties. Block copolymer micelles provide anexcellent method for such dispersions, by which the particles of a definite sizecan be formed and stabilized within the core. Thus the nano-sized compartmentsformed in this way can serve as nano-reactors for the stabilization of inorganiccrystallites or clusters, and the particle size and inter-particle distance can becontrolled by the choice of a block copolymer [155]. As a result, the blockcopolymer technique provides an efficient template and allows facile formationof transparent, homogeneous nano-dispersions. Moreover the block copolymertechnique is able to prepare thin films of colloidal polymer stabilized metaldispersions that allow one to prepare the novel functional materials with uniqueoptical and electrical properties. The block copolymer approach has been usedfor the preparation of conducting polymer nanostructures containing metalnano-particles, for instance, gold-PPy core-shell particles or nanostructures ofAu-PPy composites were prepared by using block copolymer micelles as thetemplate [156].

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编辑推荐

Conducting Polymers with Micro or Nanometer Structure describes a topicdiscovered by three winners of the Nobel Prize in Chemistry in 2000： AlanJ. Heeger， University of California at Santa Barbara， Alan G. MacDiarmid at the University of Pennsylvania， and Hideki Shirakawa at the University ofTsukuba. Since then, the unique properties of conducting polymers have ledto promising applications in functional materials and technologies. The bookfirst briefly summarizes the main concepts of conducting polymers beforeintroducing micro/nanostructured conducting polymers dealing with theirsynthesis， structural characterizations， formation mechanisms， physical and chemical properties， and potential applications in nanomaterials andnanotechnology. The book is intended for researchers in the related fieldsof chemistry， physics， materials, nanomaterials and nanodevices. MeixiangWan is a professor at the Institute .of Chemistry， Chinese Academy ofSciences， Beijing.

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