Polymers for Energy Storage and Conversion

Vikas Mittal

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DESCRIPTION

One of the first comprehensive books to focus on the role of polymers in the burgeoning energy materials market

Polymers are increasingly finding applications in the areas of energy storage and conversion. A number of recent advances in the control of the polymer molecular structure which allows the polymer properties to be more finely tuned have led to these advances and new applications. Polymers for Energy Storage and Conversion assimilates these advances in the form of a comprehensive text that includes the synthesis and properties of a large number of polymer systems for applications in areas such as lithium batteries, photovoltaics, and solar cells.

Polymers for Energy Storage and Conversion:

• Introduces the structure and properties of polymer hydrogel with respect to its applications for low to intermediate temperature polymer electrolyte-based fuel cells

• Describes PVAc-based polymer blend electrolytes for lithium batteries

• Reviews lithium polymer batteries based on ionic liquids

• Proposes the concept of the solar cell with organic multiple quantum dots (MQDs)

• Discusses solvent effects in polymer-based organic photovoltaic devices
• Provides an overview of the properties of the polymers that factor into their use for solar power, whether for niche applications or for large-scale harvesting

• Reviews the use of macroporous organic polymers as promising materials for energy gas storage

Readership
Materials scientists working with energy materials, polymer engineers, chemists, and other scientists and engineers working with photovoltaics and batteries as well as in the solar and renewable energy sectors.

ABOUT THE AUTHOR

Vikas Mittal is currently an assistant professor in the Department of Chemical Engineering at The Petroleum Institute in Abu Dhabi. He obtained his PhD in 2006 from the Swiss Federal Institute of Technology in Zurich, Switzerland. He also worked as a polymer engineer at BASF Polymer Research in Ludwigshafen, Germany. His research interests include polymer nanocomposites, compatibilization of organic and inorganic materials, polymer colloids, thermal stability studies, and anti-corrosion coatings. He has published more than fifty journal publications, authored as well as edited several books on these subjects.

SERIES

Polymer Science and Plastics Engineering

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