DESCRIPTION

An essential resource for scientists designing new energy materials for the vast landscape of solar energy conversion as well as materials processing and characterization

Based on the new and fundamental research on novel energy materials with tailor-made photonic properties, the role of materials engineering has been to provide much needed support in the development of photovoltaic devices. Advanced Energy Materials offers a unique, state-of-the-art look at the new world of novel energy materials science, shedding light on the subject’s vast multi-disciplinary approach.

The book focuses particularly on photovoltaics, efficient light sources, fuel cells, energy-saving technologies, energy storage technologies, nanostructured materials as well as innovating materials and techniques for future nanoscale electronics. Pathways to future development are also discussed.

Critical, cutting-edge subjects are addressed, including:

- Non-imaging focusing heliostat; state-of-the-art of nanostructures
- Metal oxide semiconductors and their nanocomposites
- Superionic solids; polymer nanocomposites; solid electrolytes; advanced electronics
- Electronic and optical properties of lead sulfide
• High-electron mobility transistors and light-emitting diodes

• Anti-ferroelectric liquid crystals; PEEK membrane for fuel cells

• Advanced phosphors for energy-efficient lighting

• Molecular computation photovoltaics and photocatalysts

• Photovoltaic device technology and non-conventional energy applications

Readership

The book is written for a large and broad readership including researchers and university graduate students from diverse backgrounds such as chemistry, materials science, physics, and engineering working in the fields of nanotechnology, photovoltaic device technology, and non-conventional energy.

ABOUT THE AUTHOR

Ashutosh Tiwari is an Associate Professor at the Biosensors and Bioelectronics Centre, Linköping University, Sweden; Editor-in-Chief, *Advanced Materials Letters*; Secretary General, International Association of Advanced Materials; a materials chemist and also a docent in applied physics at Linköping University, Sweden. He has published more than 350 articles, patents, and conference proceedings in the field of materials science and technology and has edited/authored more than fifteen books on the advanced state-of-the-art of materials science. He is a founding member of the Advanced Materials World Congress and the Indian Materials Congress.

Sergiy Valyukh is an Associate Professor at the Laboratory of Applied Optics, Department of Physics, Chemistry and Biology (IFM), Linköping University, Sweden. He obtained his PhD from the Taras Shevchenko National University of Kyiv in the Ukraine. In 2003, Dr. Valyukh was invited by the Swedish LCD Center and Dalarna University to conduct research in the field of applied physics of liquid crystals. In 2008—2009, he developed several new electrooptical devices for companies producing displays, based on liquid crystals, and he was nominated by the Swedish Innovation Foundation ALMI in the category “New Developer in Dalarna Business 2009.” In 2012, he became a docent in applied optics at Linköping University.