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Selected nanotechnologies for renewable energy applications

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Abstract

As the world faces serious energy challenges, the development and implementation of renewable energy technologies become increasingly important. In this article, we offer a glimpse of the role nanotechnology, in particular, innovations of nanostructures and nanomaterials, is playing in the development of selected renewable energy technologies. These technologies, based on the authors' research interests, include (1) converting the energy of sunlight directly into electricity using solar cells; (2) converting solar energy into hydrogen fuel by splitting water into its constituents; (3) storing hydrogen in solid-state forms; and (4) utilizing hydrogen to generate electricity through the use of fuel cells. It is clear that nanotechnology-enabled renewable energy technologies are starting to scale up dramatically. As they become mature and cost effective in the decades to come, renewable energy could eventually replace the traditional, environmentally unfriendly, fossil fuels. Published in 2007 by John Wiley & Sons, Ltd.

Keywords: nanotechnology, renewable energy, nanostructures, nanomaterials, solar cells, photovoltaics, solar w

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