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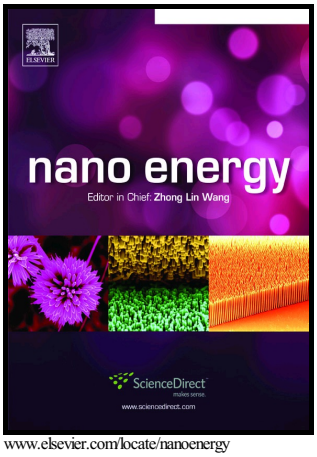

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Realizing ordered arrays of nanostructures: a versatile platform for converting and storing energy efficiently

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Abstract

To date, technical development has boosted the efficiencies of energy converting/storing devices with conventional planar architectures to be close to the corresponding theoretical values, which are hard to be further improved without reforming the device structures. Alternatively, ordered nanostructure arrays have recently emerged as efficacious scaffolds to construct devices for converting or storing energy more efficiently. To meet the global energy requirements for producing energy renewably and unitizing energy portably, herein we provide a comprehensive summarization on ordered nanostructure arrays for energy applications. This review starts with a brief introduction of techniques for realizing ordered nanostructure arrays and then recent progress on energy-related devices equipped with such advanced architectures will be reviewed. Particular emphasis will be placed on how to develop efficient devices via theoretical simulation and structural optimization.

Keywords

Ordered nanostructure arrays; Solar cells; Water splitting; Supercapacitors; Ion batteries.

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