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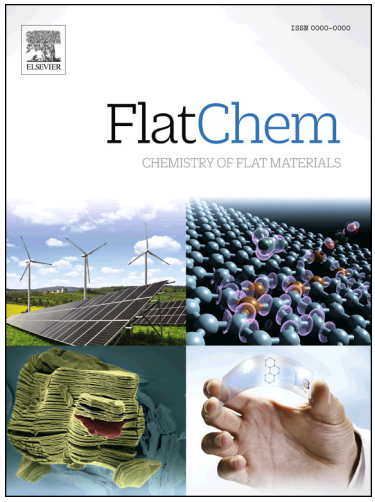

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Graphene-based composite electrodes for electrochemical energy storage devices: Recent progress and challenges

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Abstract

As the importance of applications depending on electrical energy storage devices (EESDs), including portable electronics, electric vehicles, and devices for renewable energy storage, has gradually increased, research has focused more and more on innovative energy systems for advanced EESDs in order to achieve enhanced performance. Over the past two decades, graphene-based materials have been considered as ideal electrode materials for lithium-ion, sodium-ion, and lithium/sulfur batteries, as well as supercapacitors, due to theirpromising applications for advanced electrodes. In this review, we will demonstratethe issues and challenges of each type of EESD, with an emphasis placed on the use of graphene-based electrodes. Recent trends related to research into graphene-based composite materials as electrodes in Korea will also be shown and a summary of the overall strategies and future perspectives will be given.

Keywords: Graphene-based electrode, Lithium-ion battery, Sodium-ion battery, Lithium-sulfur battery, Supercapacitor