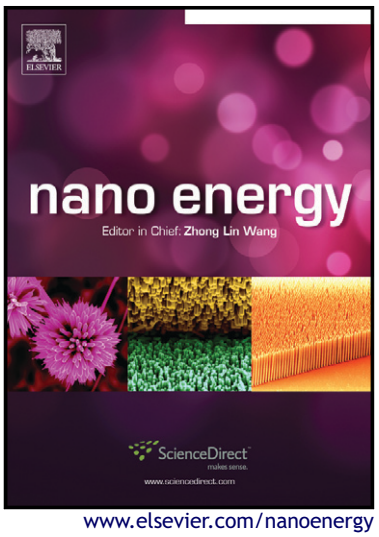

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Abstract

Sulfur species dissolution, precipitation and phase transformation during the charge and discharge process strongly affect the performance of lithium sulfur (Li-S) batteries. Interface properties between electrode and electrolyte play an important role in these batteries. In this work, four kinds of binders with different functionalities, which differs both in chemical and electrical properties, are employed to study how the interface properties affect the battery reaction mechanism. The phase transformation of sulfur species is studied in detail. Remarkable differences are observed among sulfur cathodes with different binders. More solid-phase sulfur species precipitation is observed with binders that have carbonyl functional