High areal capacity cathode and electrolyte reservoir render practical Li-S batteries

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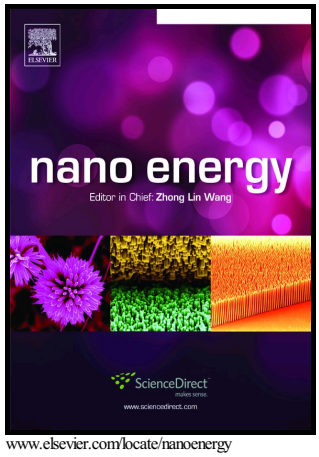

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High areal capacity cathode and electrolyte reservoir render practical Li-S batteries

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Abstract:

With the considerable development in sulfur cathode, Li-S batteries have recently witnessed a significant improvement, especially in the gravimetric capacity and cycling performance. However, maintaining high energy density of Li-S batteries and its commercialization relies on the high areal loading and high utilization of active material on the electrode, which is always ignored in the most fundamental research reports. For the Li-S batteries with much higher sulfur loading, except for the well-known issues about polysulfide dissolution, some new issues such as electron and ion transport in thick cathode, depletion of electrolyte and lithium dendrite growth need to be addressed. Here, a Li-S battery with a high areal capacity is proposed by a systematic strategy incorporating two approaches as follows: 1) a