

HIGH-RATE CAPABILITY ENABLED BY POLYSULFIDE CHEMISTRY FOR LI-S BATTERIES

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S lithiation during the operation of Li-S battery is a multi-step electrochemical process that involves different lithium polysulfide (PS) intermediates. Some of the PSs are highly soluble in the aprotic organic electrolyte, leading to PS dissolution from the electrode. PS dissolution has been a major issue in the research of Li-S battery. It has been considered as an unfavorable process that is directly linked to the deterioration of several key performance indexes, such as cycle life, self-discharge and coulombic efficiency, of the battery. However, as revealed in this presentation, the PS dissolution process could have a profound effect on the rate capability of the Li-S battery. With properly designed electrode architecture, the rate capability of a Li-S battery can in fact be substantially enhanced by taking advantage of PS dissolution.