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Preparation of surface modified nanosalts and its application to an organic electrolyte additive

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Lithium sulfonyl silica (LSS) was synthesized by replacing the surface -OH group in fumed silica with $(\text{CH}_2)_3\text{SO}_3\text{Li}$ and adopted as electrolyte additive for lithium ion battery. 3 wt.% of the synthesized particles in 1 M LiPF_6 (EC/DMC=1:1) showed improved ionic conductivity and potential window over the pristine electrolyte. The discharge capacity of the LiCoO_2 /graphite is particularly enhanced with the addition of LSS at higher C-rates due to the enhanced ionic conductivity at room temperature. The LiCoO_2 /graphite cells using 1.0 M LiPF_6 /EC/DMC (1:1) and 1.0 M LiTFSI /EC/DMC (1:1) with the additive also showed superior performance for the self-discharge test carried out at 45 for 200 days. These positive impacts of LSS on LiCoO_2 /graphite cells warrant its use in lithium ion batteries.

Biography

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