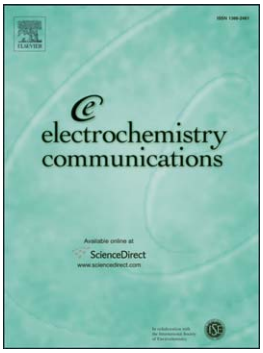

Achieving high capacity retention in lithium-sulfur batteries with an aqueous binder

¡!–¡QUERY id="Q1" type="boolean" replies="Yes—No" name="Spice3G"¿¡ce:para¿The author names have been tagged as given names and surnames (surnames are highlighted in teal color). Please confirm if they have been identified correctly.¡/ce:para¿¡/QUERY¿–¿Yan-Qiu Lu, Jun-Tao Li, Xin-Xing Peng, Tao Zhang, Ya-Ping Deng, Zhan-Yu Wu, Li Deng, Ling Huang, Xiao-Dong Zhou, Shi-Gang Sun

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Achieving High Capacity Retention in Lithium-Sulfur Batteries with an Aqueous Binder

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Abstract

In this article, we report improved capacity retention in lithium-sulfur (Li-S) batteries by replacing the conventional Polyvinylidene fluoride (PVDF) binder with inexpensive guar gum (GG). The S/GG cathode exhibits a discharge capacity of 777 mAh g^{-1} at 0.2 C after 150 cycles, in comparison to 491 mAh g^{-1} of S/PVDF cathode. FTIR results show that there is interaction between GG and sulfur species. This interaction is potentially capable of maintaining the active sulfur species, which could to a certain extent inhibit shuttling effect. What's more, GG shows limited dissolving and swelling capacity in the electrolyte and higher viscosity and hardness than those of PVDF. Such properties of GG provide the electrode with appropriate extensibility to alleviate the negative impact from the volume