A Functional TiO₂-Coated Separator for High-Performance Li-S Batteries

Rui Wang, Jianna Deng, Jing Li*, Manqin Tang, Pengyu Li, Ying Zhang

State Key Laboratory of Environmentally Friendly Energy Materials, School of Materials Science and Engineering, Southwest University of Science and Technology, Mianyang 621010, China

*E-mail: xy13787103391@126.com

doi: 10.20964/2020.01.46

Received: 8 June 2019 / Accepted: 26 August 2019 / Published: 30 November 2019

The shuttle effect of polysulfides during a cycle severely limits the further development of lithium-sulfur (Li-S) batteries. Therefore, a functional separator coated with TiO₂ was prepared. This separator chemically adsorbed polysulfides, which reduced the shuttle effect and improved the cycle stability and specific capacity during cycling. Moreover, the initial discharge capacity of the battery with a spherical TiO₂-coated separator reached 1086 mAh g⁻¹ and after 100 cycles remained at 793 mAh g⁻¹, with a rate of 0.1 C. The coulombic efficiency was kept at 99%, and the capacity attenuation of each cycle was only 0.26%, which showed good cycle stability.

Keywords: Li-S batteries; TiO₂; Cyclic stability; Coulombic efficiency; Shuttle effect

[FULL TEXT](#)

© 2020 The Authors. Published by ESG (www.electrochemsci.org). This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution license (<http://creativecommons.org/licenses/by/4.0/>).