Protected lithium anode with porous Al$_2$O$_3$ layer for lithium-sulfur battery

Hang-Kun Jing, Ling-Long Kong, Sheng Liu, Guo-Ran Li and Xue-Ping Gao

![Graph of TG curves](image)

Fig.S1 TG curves of pure sulfur and S/C composites under Ar atmosphere with a heating rate of 10 °C min$^{-1}$.

![SEM images](image)

Fig S2 Cross-sectional SEM images of protected Li anode with (a) 0.23, (b) 0.58, and (c) 0.73 mg cm$^{-2}$ coating amounts of Al$_2$O$_3$ coating layer on lithium anode surface, respectively.

![SEM images](image)

Fig.S3 Cross-sectional SEM images of protected Li anode with Al$_2$O$_3$ layer (0.58 mg cm$^{-2}$) after initial three cycling at (a) discharged state and (b) charged state.
Fig.S4 The surface morphology of sulfur cathode: (a) before cycling (b) with fresh Li anode after 50\textsuperscript{th} cycling (c) with protected Li anode after 50\textsuperscript{th} cycling.