Supporting Information

Sb nanosheets modified separator for Li-S batteries with excellent electrochemical performance

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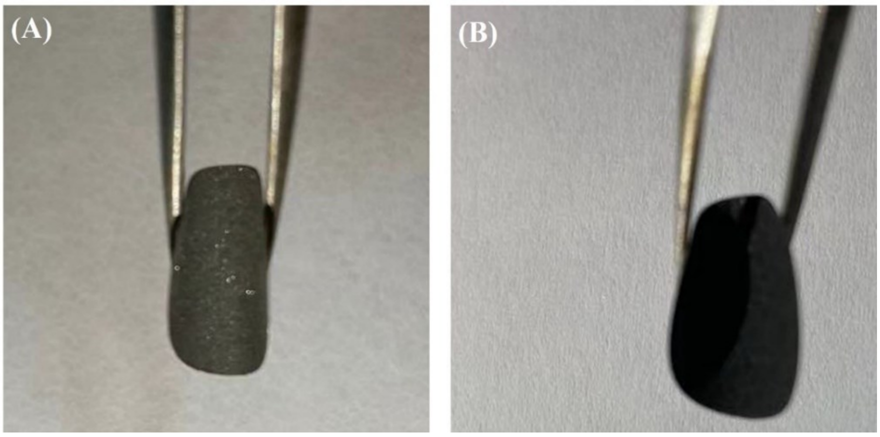

Fig. S1. Photograph of Sb/separator (A) and Graphene/separator (B).

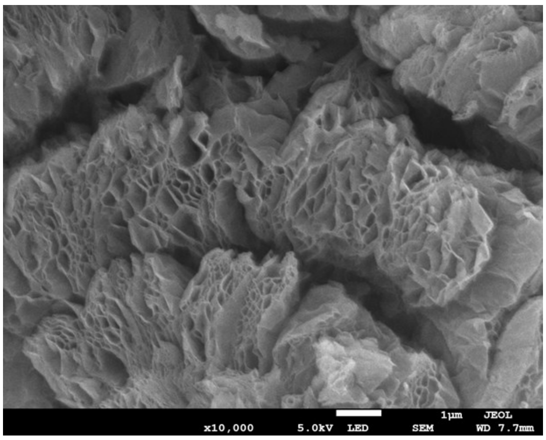

Fig. S2. SEM image of the graphene.

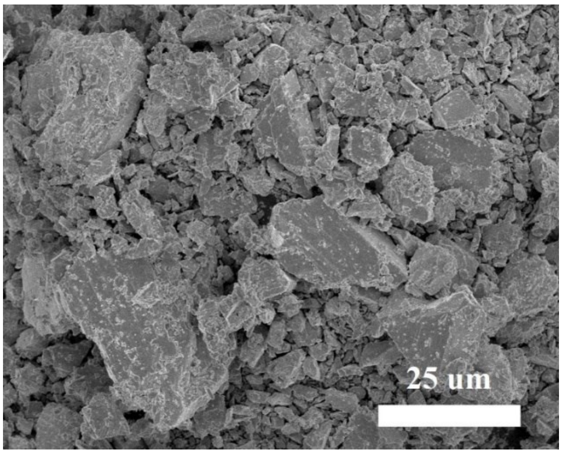

Fig. S3. FESEM image of the pristine Sb powder.

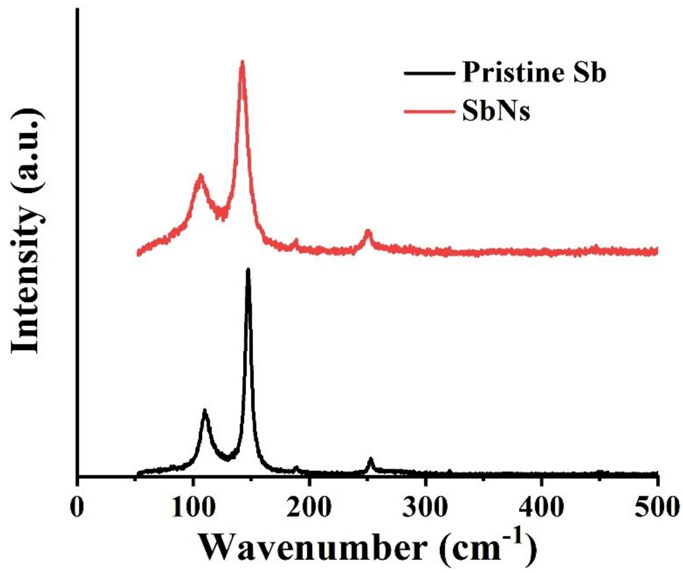

Fig. S4. Raman spectra of the pristine Sb and SbNs powders.

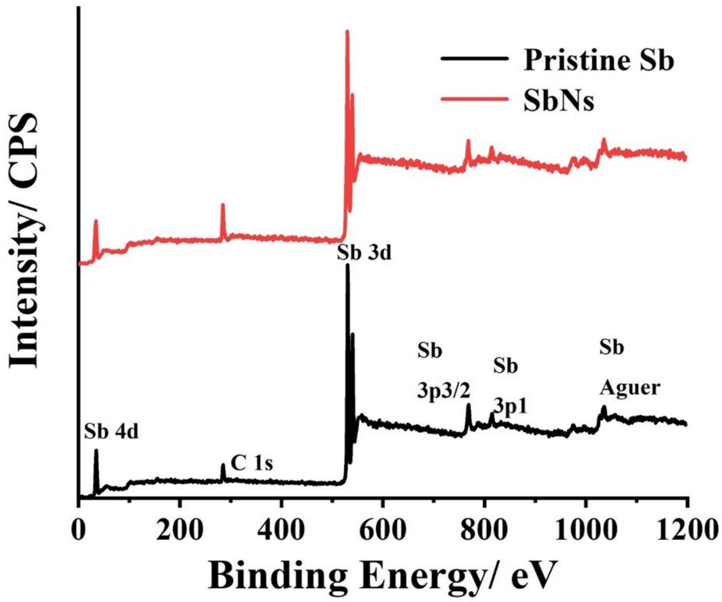

Fig. S5. XPS spectra of the pristine Sb and SbNs powders.

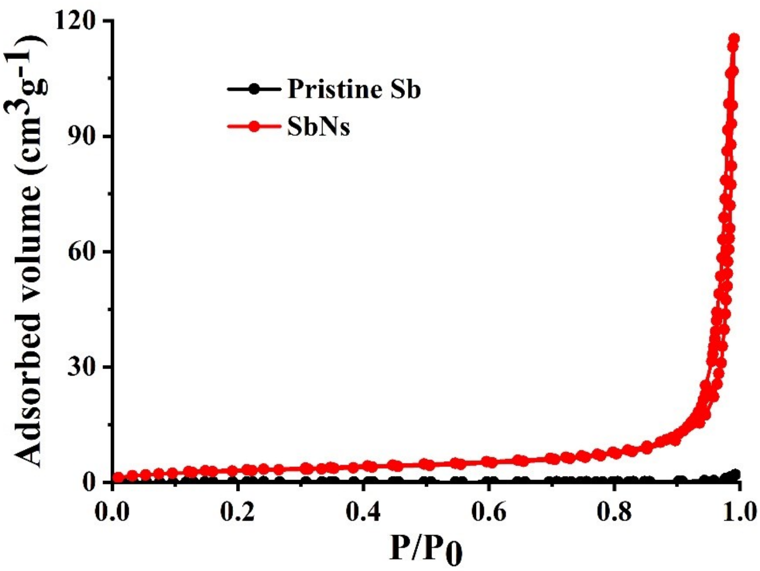

Fig. S6. N_2 adsorption/desorption isotherms of pristine Sb and SbNs powders.

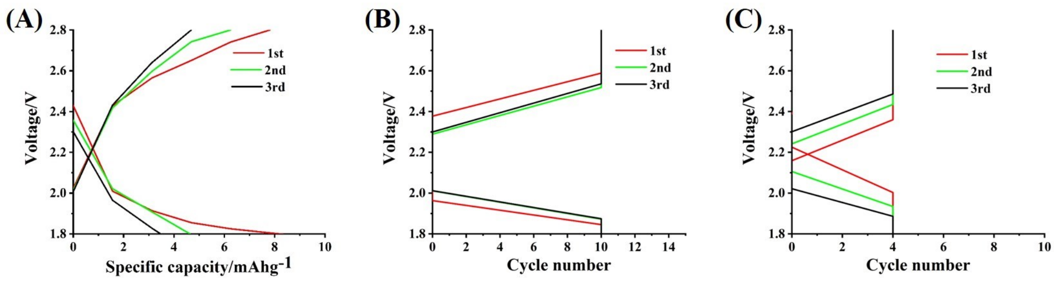

Fig. S7. Galvanostatic discharge-charge curves of SbNs (A), Sb (B) and graphene (C) in the voltage range of 1.8-2.8 V at a current density of 0.1 A g^{-1}.

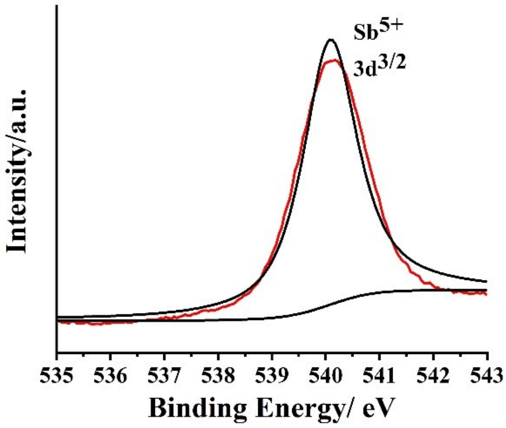

Fig. S8. Sb 3d high-resolution XPS spectra of SbNs after electrochemical cycling in Li-S batteries.

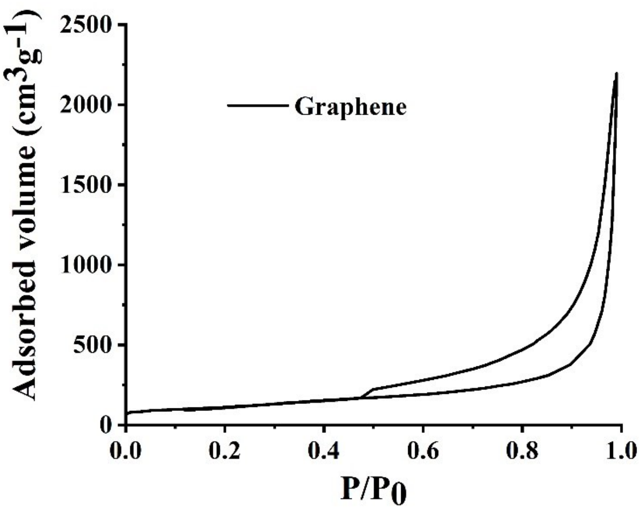

Fig. S9. N_2 adsorption/desorption isotherms of graphene.

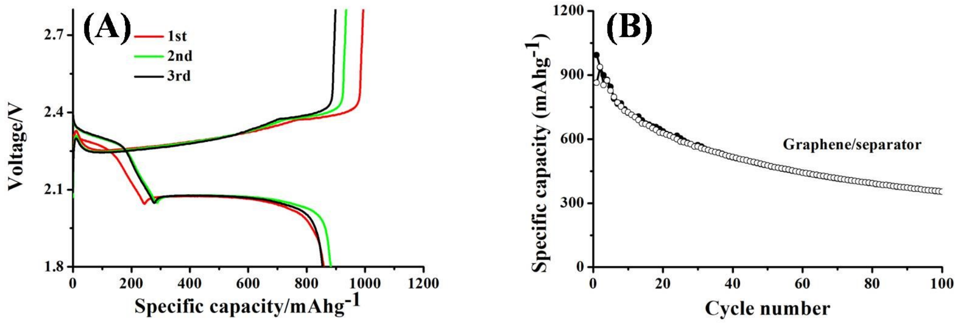

Fig. S10. (A) Initial three charge/discharge profiles of Li-S battery using Graphene/separator at a current density of 0.1 A g^{-1}. (B) Charge-discharge capacities of Li-S batteries using Graphene/separator at a current density of 0.1 A g^{-1}.

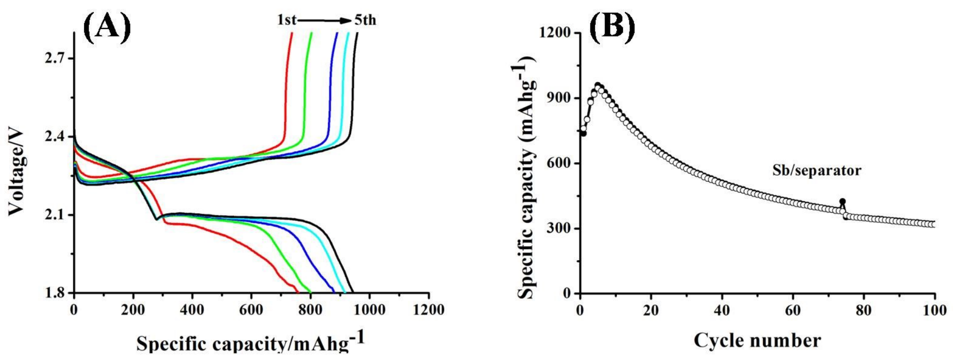

Fig. S11. (A) Initial five charge/discharge profiles of Li-S battery using Sb/separator at a current density of 0.1 A g^{-1}. (B) Charge-discharge capacities of Li-S batteries using Sb/separator at a current density of 0.1 A g^{-1}.

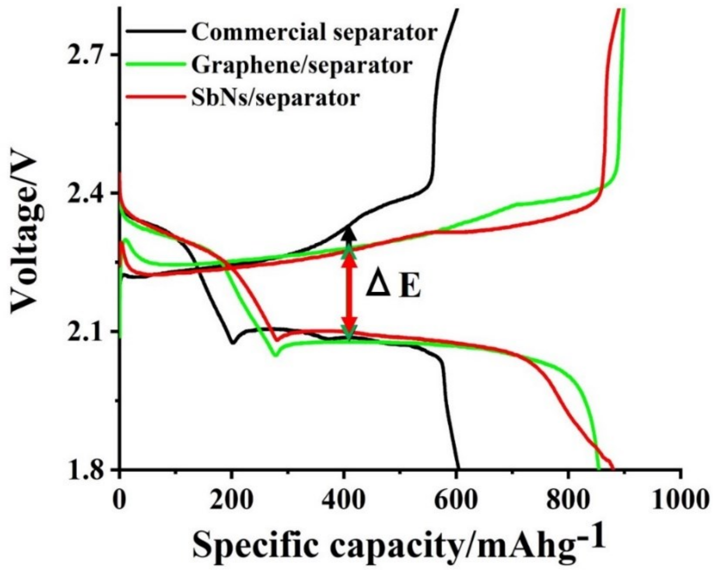

Fig. S12. Polarization voltages of Li-S batteries using SbNs/separator, Graphene/separator and pristine separator.

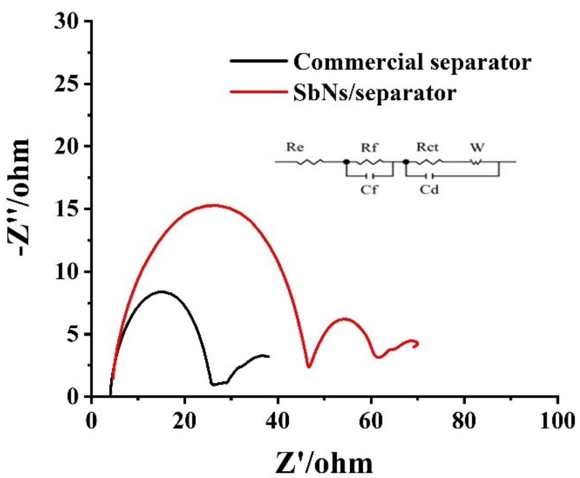

Fig. S13. Electrochemical impedance spectrum of symmetric batteries with Li foil and commercial separator (or SbNs/separator). The Rf of symmetric battery with Li foil and SbNs/separator is a little larger than that of symmetric battery with Li foil and commercial separator, indicating the electrochemical impedance value of SbNs/separator is a little larger than that of commercial separator.

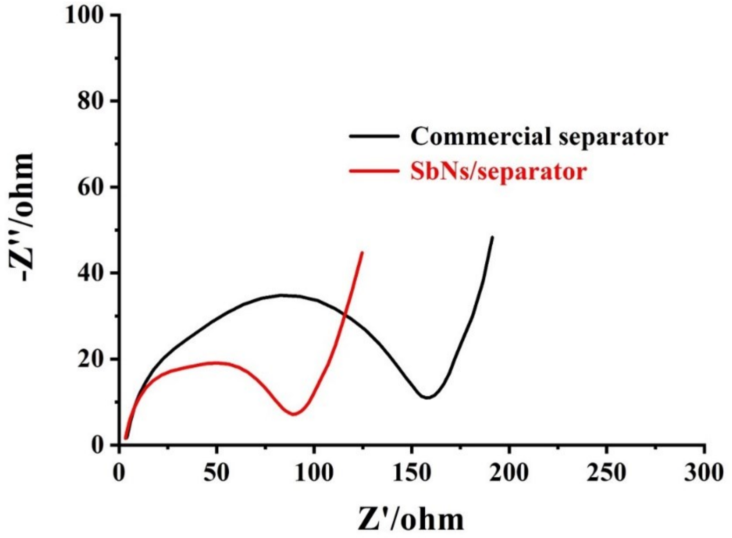

Fig. S14. AC impedance spectra of Li-S batteries using SbNs/separator (or pristine separator) as separator (discharged to 1.8 V after 10 cycles at 0.1 A g^{-1}).

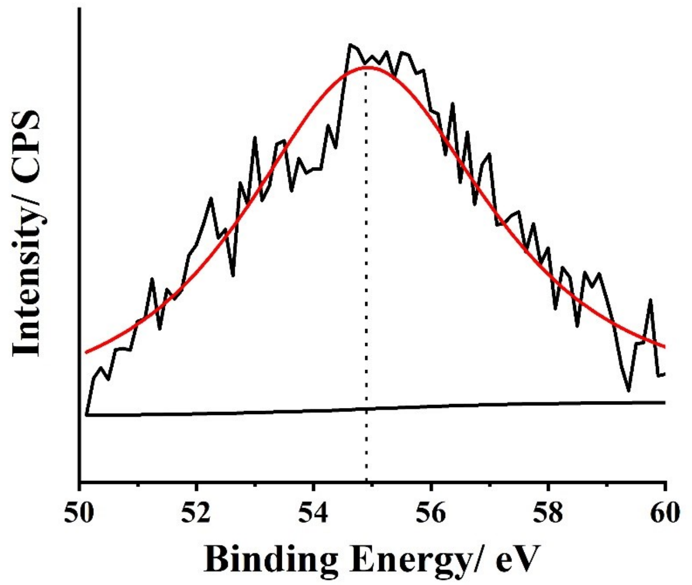

Fig. S15. The Li 1s XPS spectra of SbNs-Li_2S_6 composite.