

Figure S1. Parent ZIF-8 TEM micrographs ((a) low magnification and (b) high magnification).

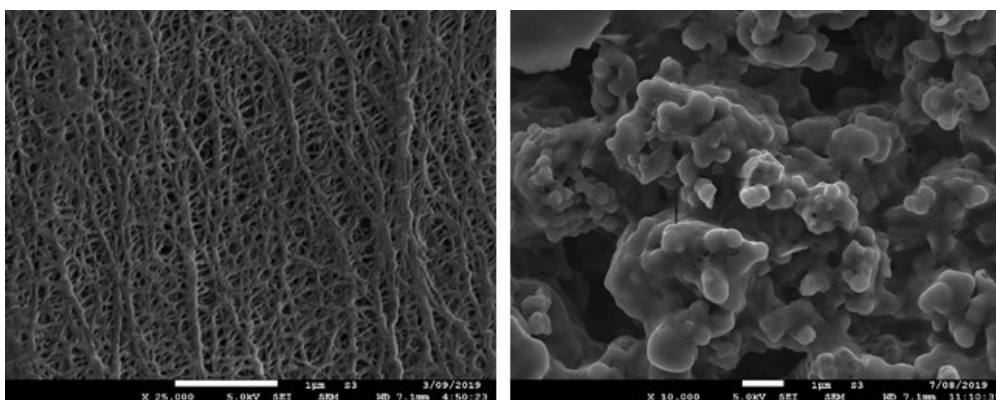


Figure S2. SEM micrographs ((Left) pristine Celgard PP separator and (Right) ZHC-coated Celgard PP separator).

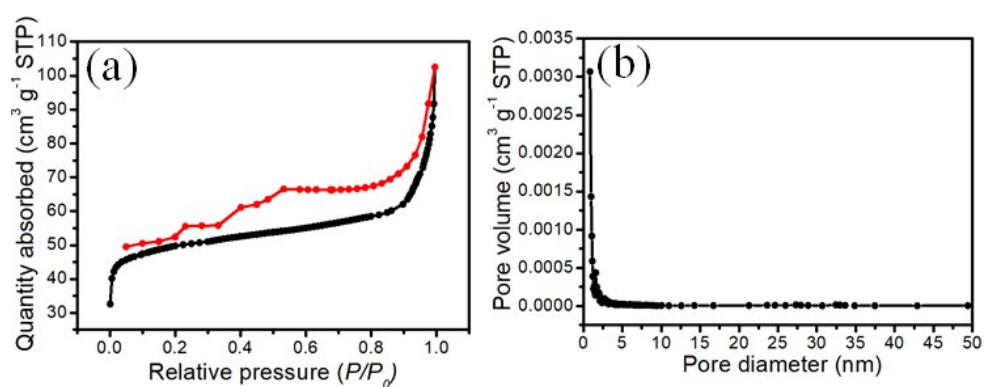


Figure S3. (a)  $N_2$  adsorption-desorption isotherms and (b) NLDFT pore size distribution curves for ZHC.

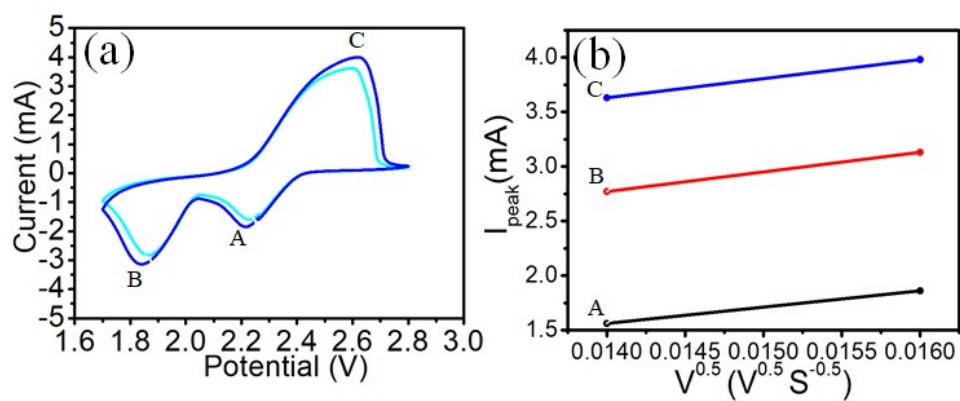


Figure S4. (a) CV curve for ZHC contained LSBs and (b) its respective rate-dependent diffusion curves.

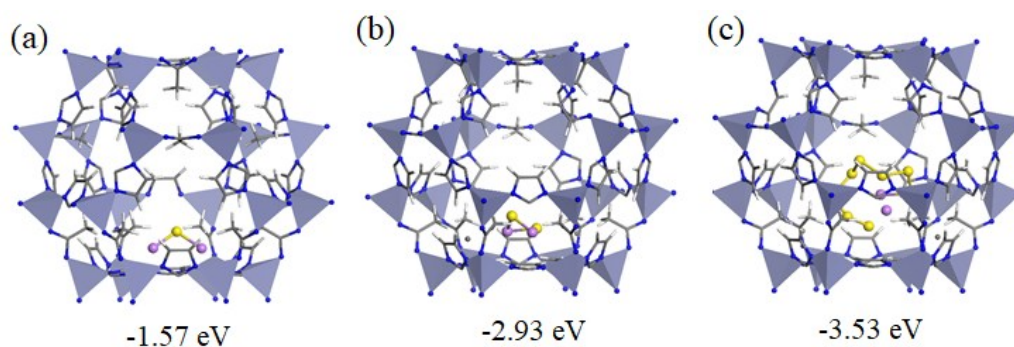


Figure S5. DFT calculation of Zn and N with (a)  $\text{Li}_2\text{S}$ , (b)  $\text{Li}_2\text{S}_2$  and (c)  $\text{Li}_2\text{S}_8$ .

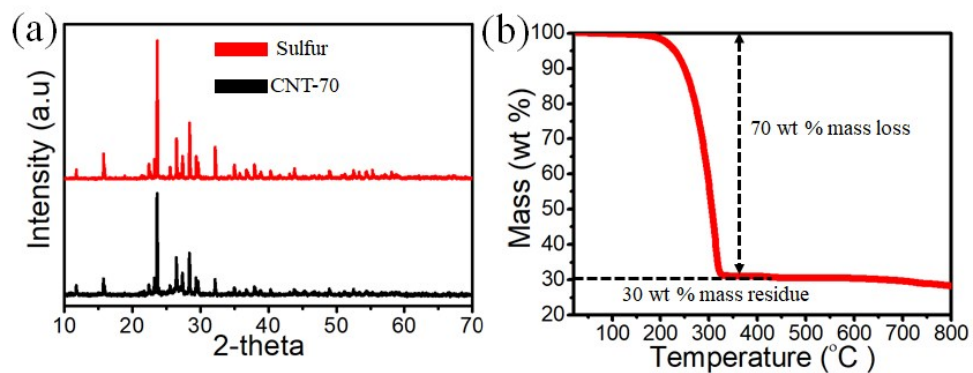


Figure S6. (a) XRD of CNT-70 and sulfur powders. (b) TGA analysis of CNT-70 - showing 70 wt % loss after 300  $^{\circ}\text{C}$ .