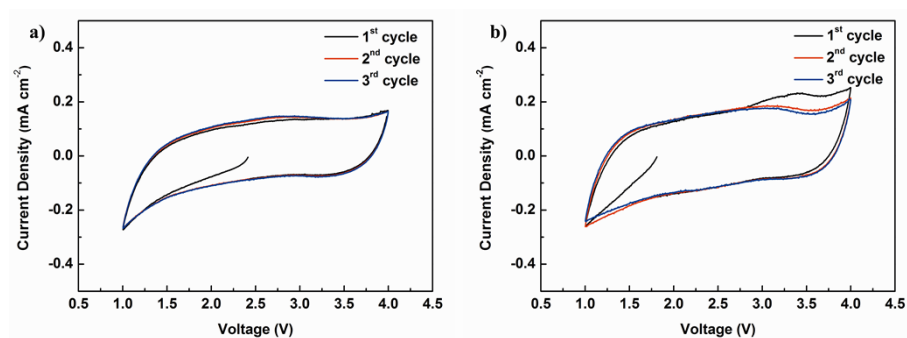
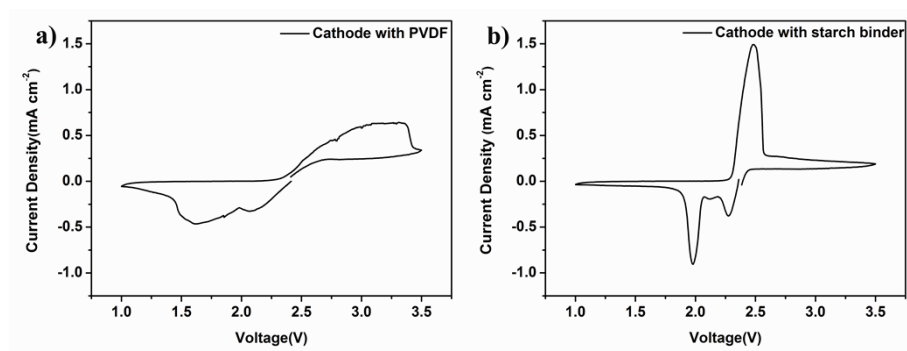


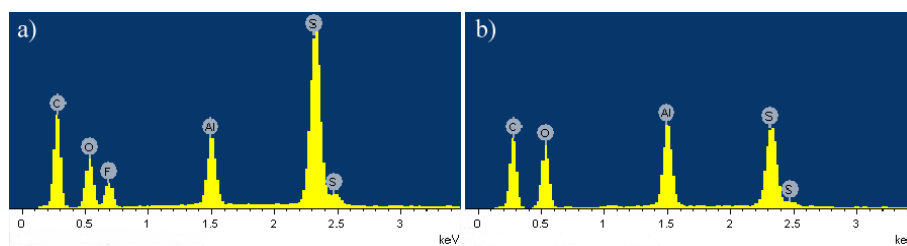
## Electronic Supplementary Information (ESI)



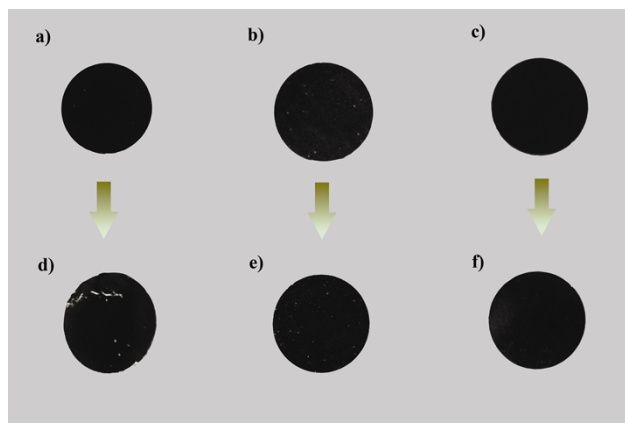
**Fig. S1.** Electrochemical stability of a) the starch binder and b) PVDF. To eliminate the interference of active materials, the sulfur-free cathodes were used here. Only a little difference between the 1<sup>st</sup> CV curve and the subsequent CV curves of the PVDF binder is observed beyond 3V. It maybe results from the irreversible oxidation of the impurities in PVDF or NMP and do not affect the electrochemical performance of the sulfur cathodes continuously.



**Fig. S2.** CV curves of a) the sulfur/PVDF cathode and b) the sulfur/starch cathode



**Fig. S3.** EDS results of the elements on the surface of a) the sulfur/starch cathode and b) the sulfur/PVDF cathode after 100<sup>th</sup> charge.



**Figure. S4.** Comparison of the cathodes before and after soaked in the coin-type cell with different liquid electrolyte. ( a) the pristine sulfur/PVDF cathode b) the pristine sulfur/starch cathode c) the pristine sulfur/PVDF cathode d) the sulfur/PVDF cathode soaked in ether liquid e) the sulfur cathode soaked in ether liquid f) the sulfur soaked in carbonate liquid) The soaking time was 24h.