

In-situ grown S nanosheets on Cu foam: An ultrahigh electroactive cathode for room-temperature Na-S batteries

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Room-temperature sodium-sulfur batteries are competitive candidates for large-scale stationary energy storage due to their low price and high theoretical capacity. Herein, pure S nanosheet cathodes can be grown in-situ on three-dimensional Cu foam substrate with the condensation between binary polymeric binders, serving as a model system to investigate the formation and electrochemical mechanism of unique S nanosheets on the Cu current collectors. Based on the confirmed conversion reactions to Na_2S , The constructed cathode exhibits ultra-high initial discharge/charge capacity of 3189/1403 mAh g^{-1} . These results suggest that there is great potential to optimize S cathode by exploiting low-cost Cu substrates instead of conventional Al current collectors.

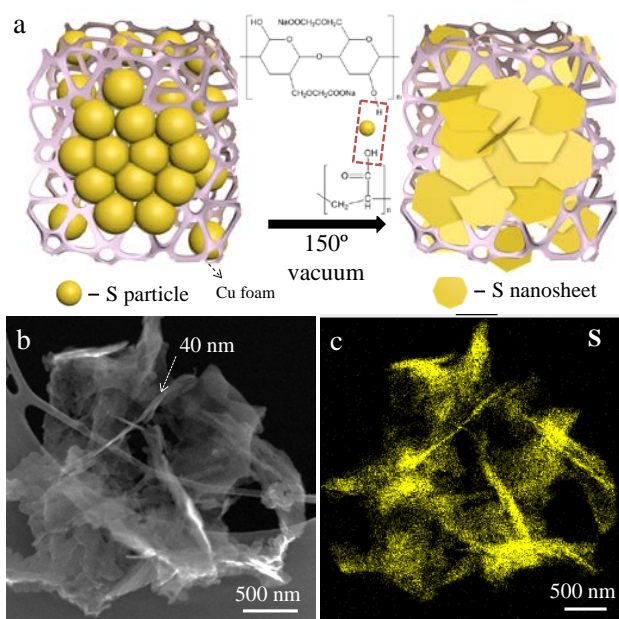


Figure 1. (a) Schematic illustrations of S nanosheets in-situ grown on 3-D Cu foam; (b) Scanning transmission electron microscope (STEM) image of S nanosheets and (c) the corresponding mapping of S element.