Electronic Supplementary Information (ESI):

A facile template-free approach for the solid-phase synthesis of CoS$_2$ nanocrystals and their enhanced storage energy in supercapacitor

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**Electrochemical Tests.** For the electrochemistry tests, a three-electrode system was used. Hg/HgO electrode was employed as the reference electrode. A Pt plate was used as the counter electrode. The working electrode was fabricated by mixing the as-synthesized CoS$_2$ NCs (70 wt %), acetylene black (25 wt %) and poly (tetrafluorene ethylene) binder (5 wt %). The mixture was pressed on to nickel foam current-collectors to produce the electrode. The electric capacity properties of CoS$_2$ NCs were evaluated using cyclic voltammogram and galvanostatic charge-discharge methods (CHI 660C electrochemical analyzer, CH Instruments).
Figure S1. FT-IR spectrum of thiourea (up) and the CoS$_2$ at 4 h (down).
Figure S2. TGA curve of the CoS$_2$ in N$_2$ with a temperature ramp of 5 °C min$^{-1}$. 
Figure S3. Charge-discharge behavior of a CoS$_2$ prepared at 4 h and 24 h.
Figure S4. The CV curves of electrodes fabricated from CoS$_2$ at 24 h (electrolyte: 2 M KOH) at various scan rates: 5, 10, and 50 mV s$^{-1}$. 