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**Supplementary Information**

**Anionic and Cationic Surfactants-Assisted Hydrothermal Synthesis of Cobalt Oxide  
Nanoparticles as The Active Electrode Material for Supercapacitor**

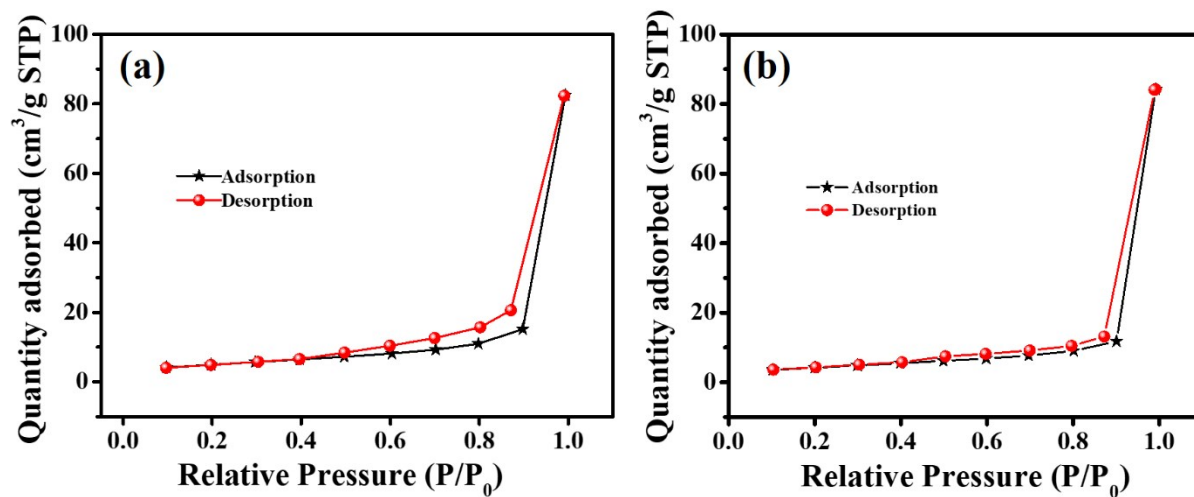
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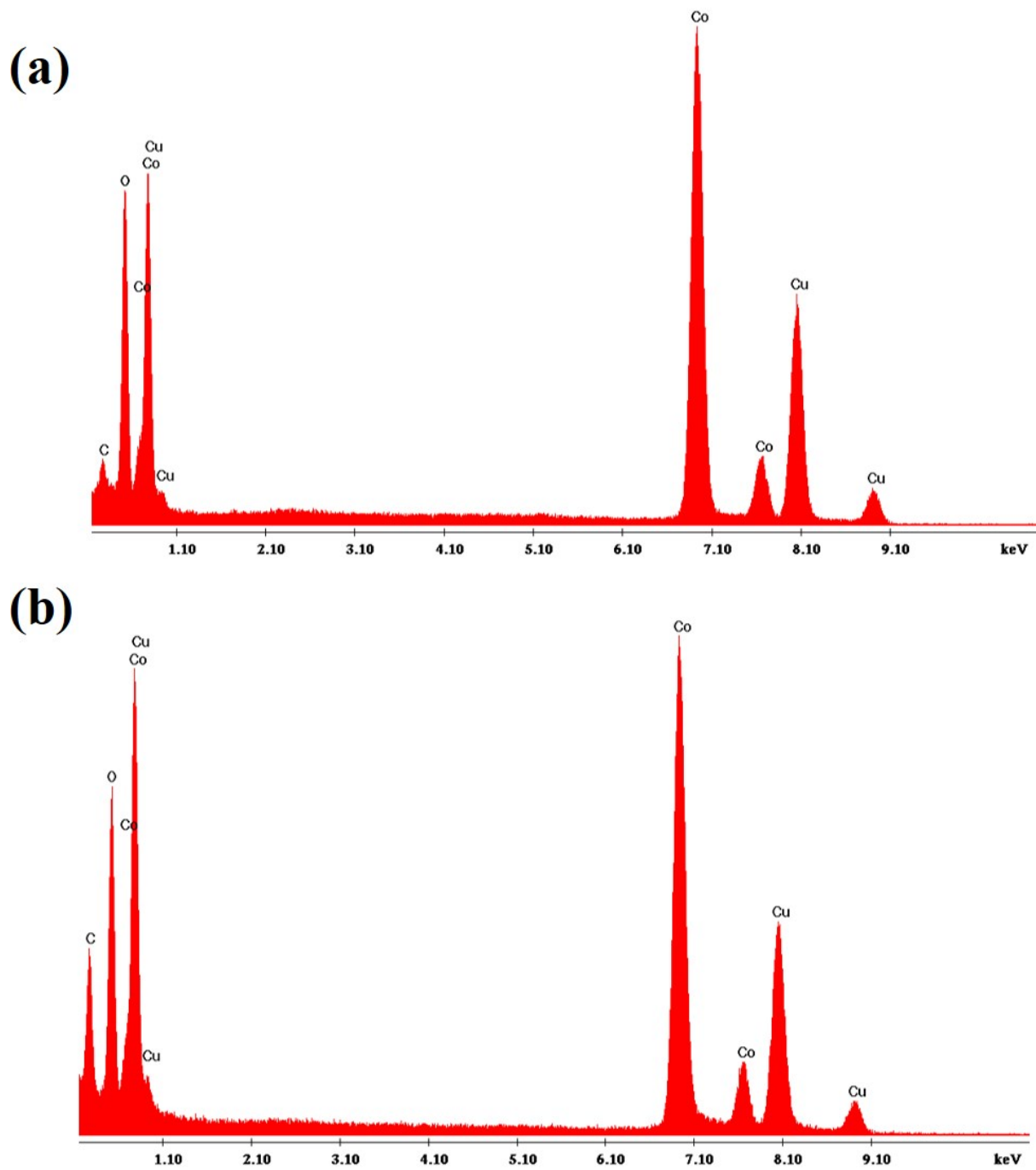
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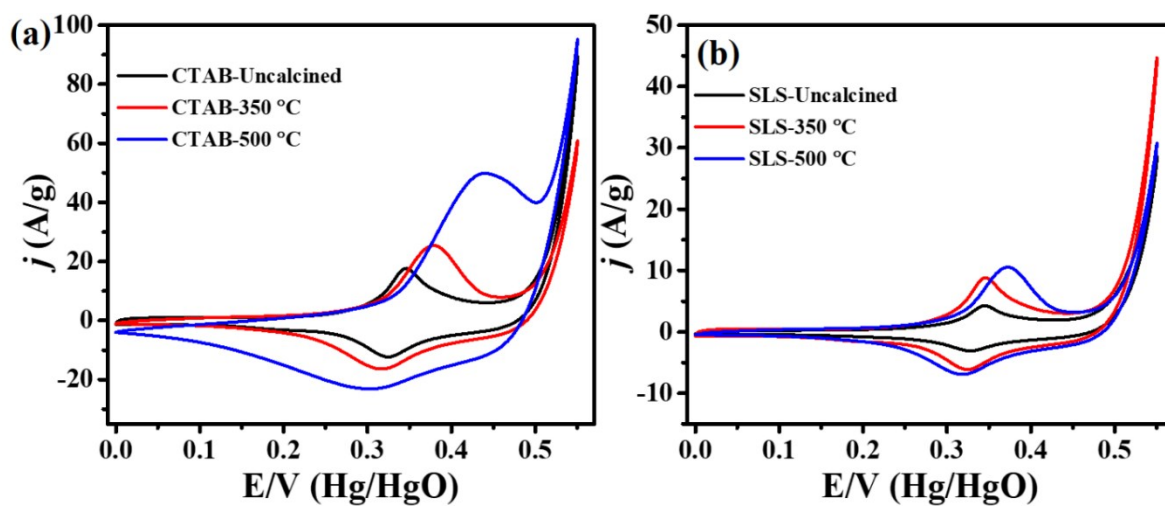
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**Fig. S 1** Nitrogen desorption/adsorption isotherm for the (a) CTAB-500 °C and SLS-500°C samples



**Fig. S 2** EDS spectrum of (a) CTAB-500 °C and (b) SLS-500 °C.



**Fig. S 3** (a) Cyclic voltammograms of (a) CTAB-Uncalcined, CTAB-350 °C, and CTAB-500 °C and (b) SLS-Uncalcined, CTAB-350 °C and SLS-500 °C and (b) cyclic stability of CTAB-500 °C.

<b>Morphology</b>	<b>Broad classification</b>	<b>F g<sup>-1</sup></b>	<b>References</b>
Co <sub>3</sub> O <sub>4</sub> nanocube	3D	350	1
nickel–cobalt-based binary metal phosphide (NiCoP) hollow spheres	3D	960	2
Layered Co <sub>3</sub> O <sub>4</sub> flakes	2D	263	3
nanosheets (Co <sub>3</sub> O <sub>4</sub> /rGONS)	2D	400	4
Co <sub>3</sub> O <sub>4</sub> Nanosheets	2D	693	5
Co <sub>3</sub> O <sub>4</sub> Nanorods	1D	281	6

**Table S1** Different structures with capacitance

### References:

1. X. Liu, Q. Long, C. Jiang, B. Zhan, C. Li, S. Liu, Q. Zhao, W. Huang and X. Dong, *Nanoscale*, 2013, **5**, 6525-6529.
2. U. Costantino, V. Bugatti, G. Gorrasi, F. Montanari, M. Nocchetti, L. Tammara, and V. Vittoria, *ACS Appl. Mat. Interfaces*, 2009, **1**, 668.
3. L. Xie, K. Li, G. Sun, Z. Hu, C. Lv, J. Wang, C. Zhang, *Journal of Solid State Electrochemistry*, 2012, **17**, 55-61.
4. Z. Song, Y. Zhang, W. Liu, S. Zhang, G. Liu, H. Chen, J. Qiu, *Electrochimica Acta*, 2013, **112**, 120-126.
5. C. Zhao, X. Wang, S. Wang, Y. Wang, Y. Zhao, W. Zheng, *International Journal of Hydrogen Energy*, 2012, **37**, 11846-11852.
6. G. Wang, X. Shen, J. Horvat, B. Wang, H. Liu, D. Wexler, J. Yao, *The Journal of Physical Chemistry C*, 2009, **113**, 4357-4361.