

**Ni<sub>0.5</sub>Co<sub>0.5</sub>S Nano-Chains: A High-performing Intercalating Pseudocapacitive Electrode in Asymmetric Supercapacitors (ASC) mode for the development of Large-scale Energy Storage Devices**

Vishal Kushwaha<sup>a</sup>, K. D. Mandal<sup>a</sup>, Asha Gupta<sup>a\*</sup>, and Preetam Singh<sup>b\*</sup>

- a. Department of Chemistry, Indian Institute of Technology (Banaras Hindu University) Varanasi, Uttar Pradesh, 221005, India
- b. Department of Ceramic Engineering, Indian Institute of Technology (Banaras Hindu University) Varanasi, Uttar Pradesh, 221005, India

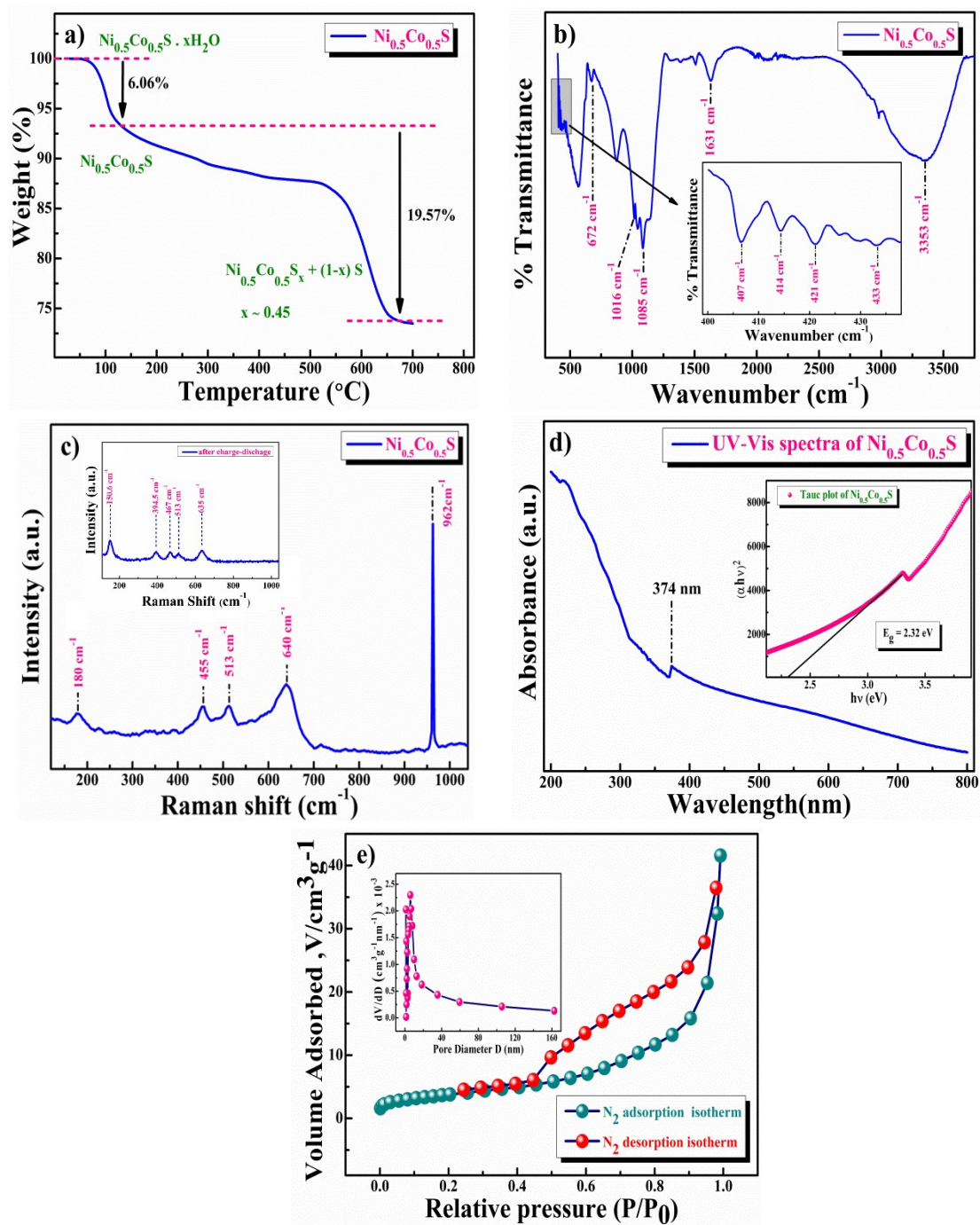
**\*: corresponding Author**

**Email: [asha.chy@itbhu.ac.in](mailto:asha.chy@itbhu.ac.in), [toashagupta@gmail.com](mailto:toashagupta@gmail.com)**

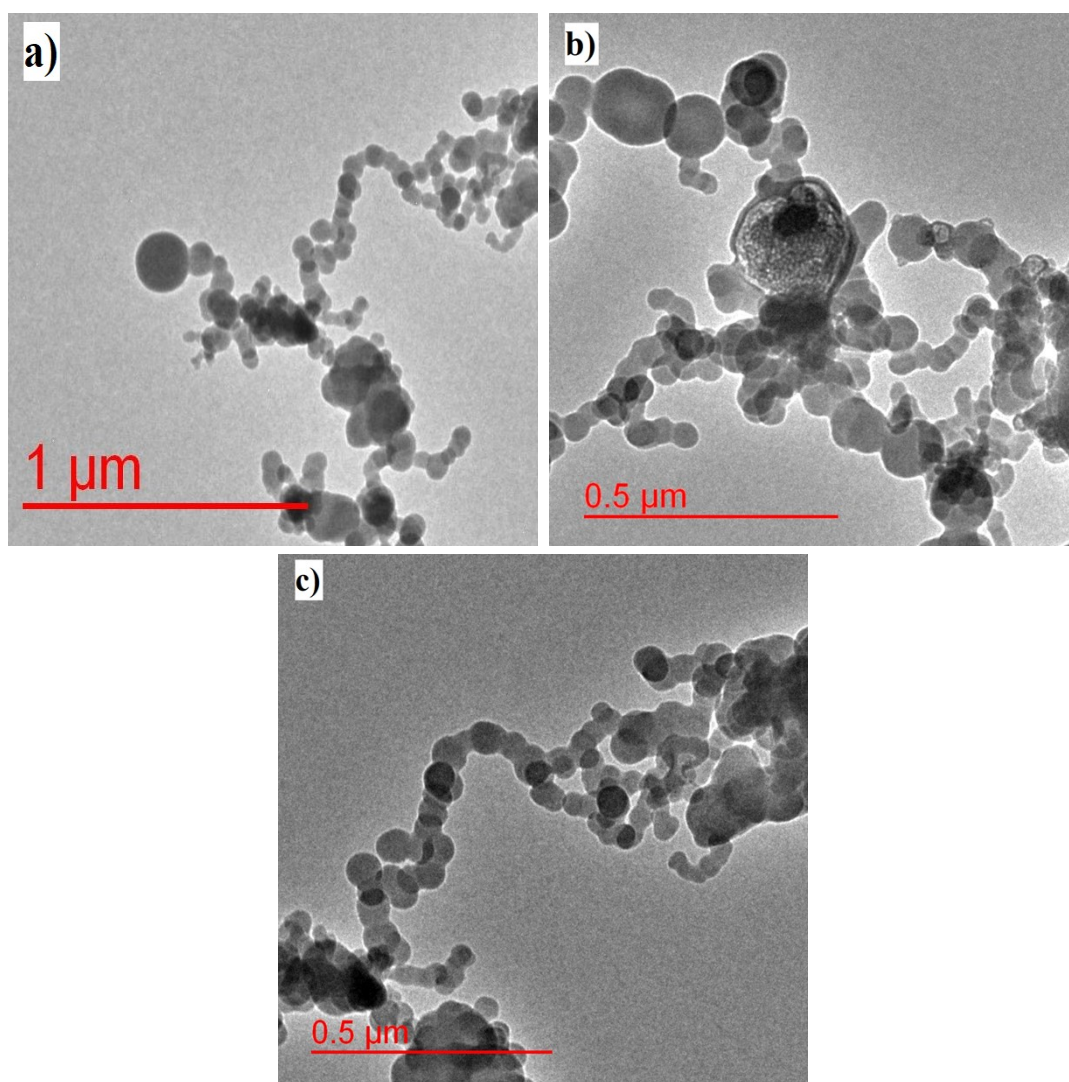
**Phone: 91-6390363140**

**Email: [preetamsingh.cer@itbhu.ac.in](mailto:preetamsingh.cer@itbhu.ac.in), [preetamchem@gmail.com](mailto:preetamchem@gmail.com)**

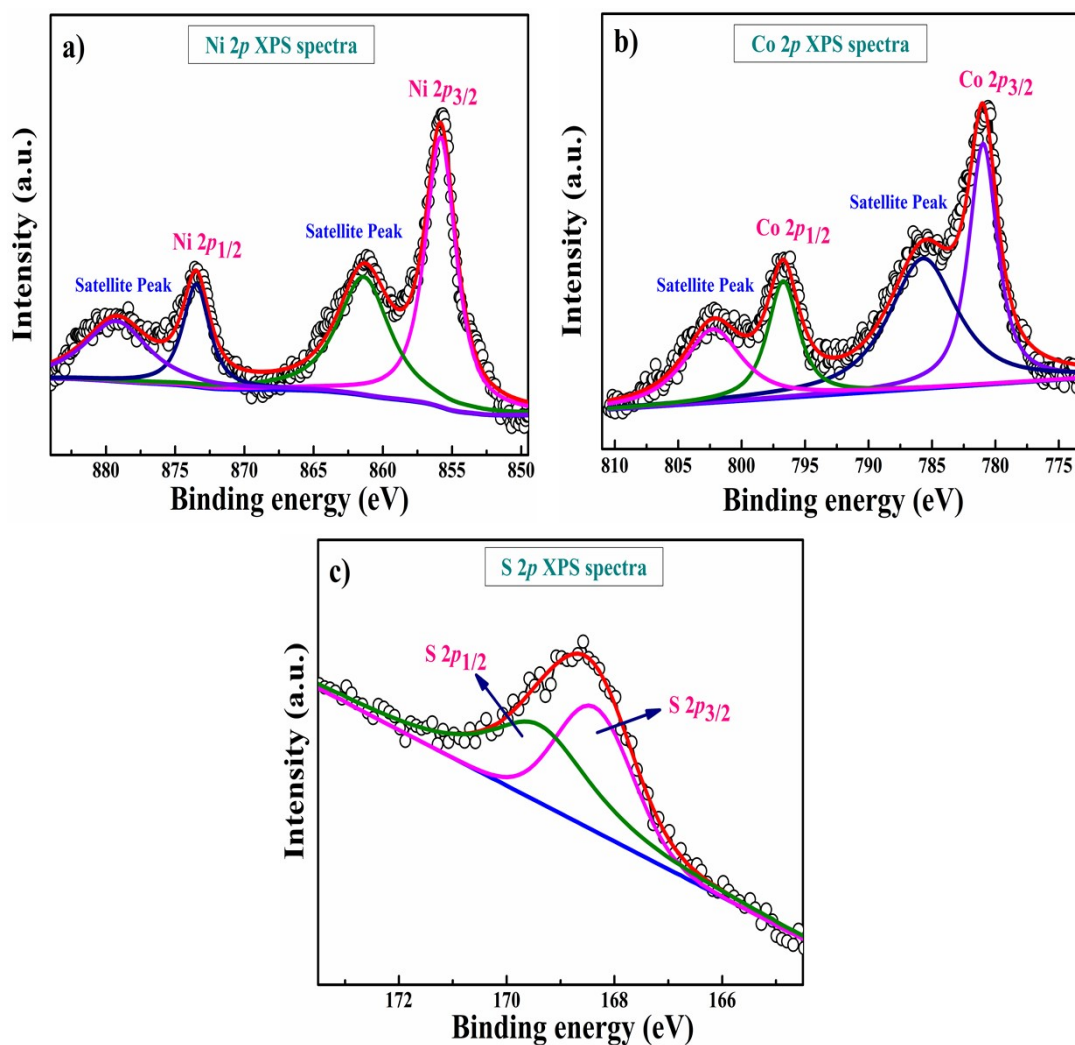
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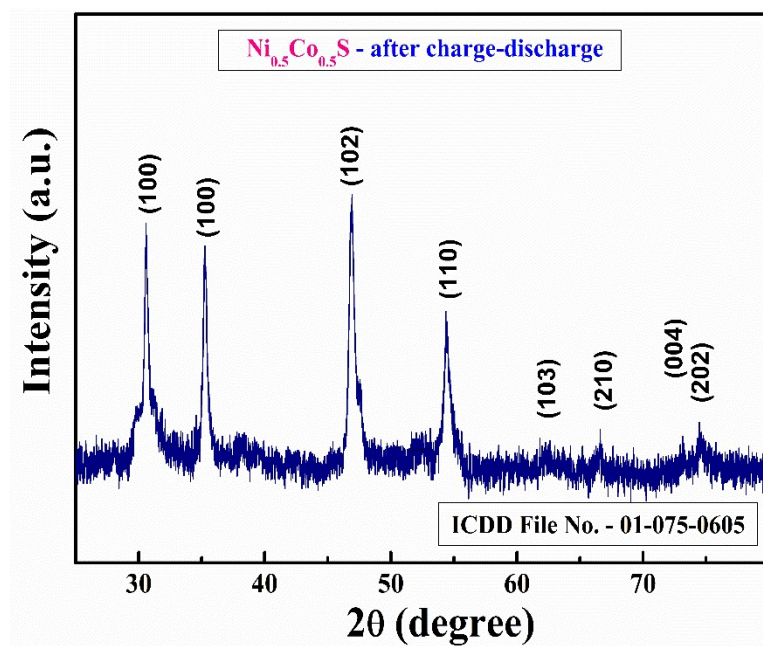
**Figure S1.** (a) TGA of  $\text{Ni}_{0.5}\text{Co}_{0.5}\text{S}$  nano-chains in an  $\text{N}_2$  atmosphere, (b) FT-IR spectrum, (c) Raman spectrum, (d) UV-Visible spectrum (inset shows Tauc plot) and (e)  $\text{Ni}_{0.5}\text{Co}_{0.5}\text{S}$  nano-chains BET nitrogen adsorption/desorption isotherm



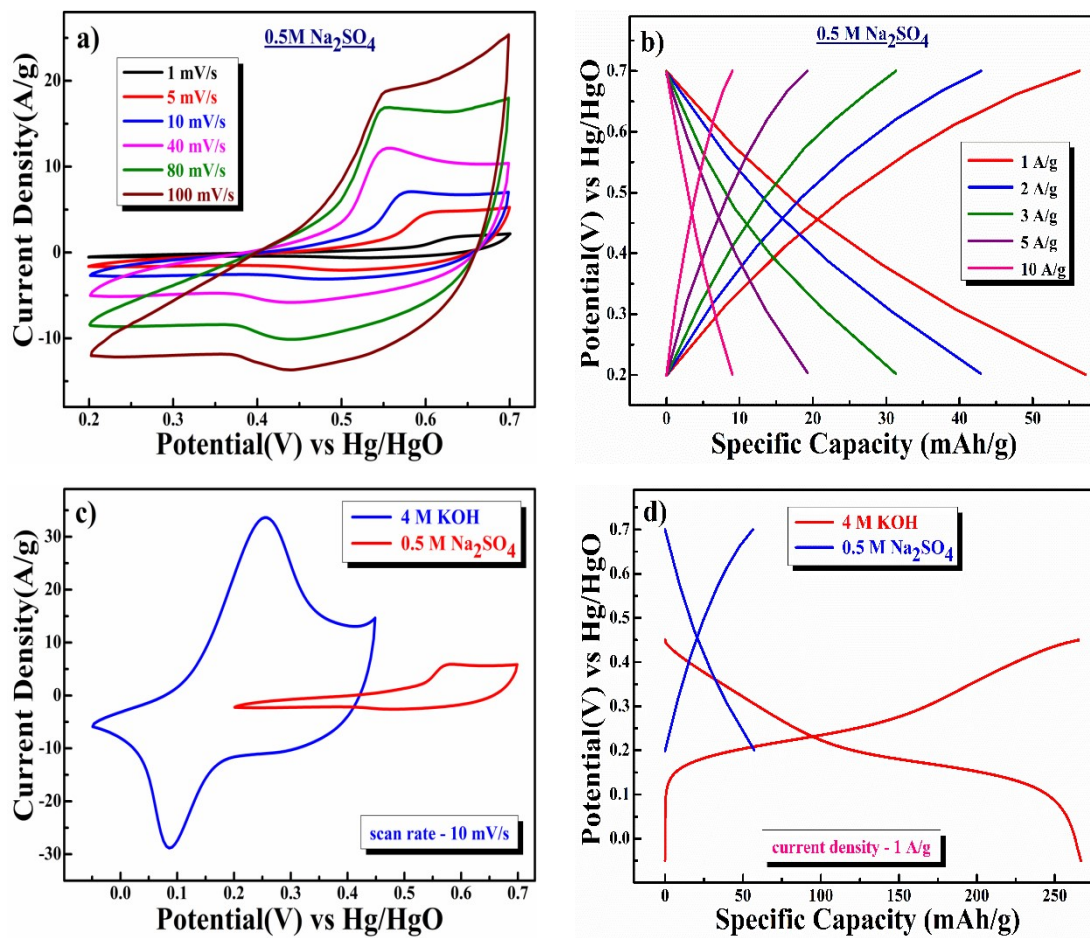
**Figure S2.** HRTEM images of  $\text{Ni}_{0.5}\text{Co}_{0.5}\text{S}$  nano-chains after the complete charge-discharge cycle.



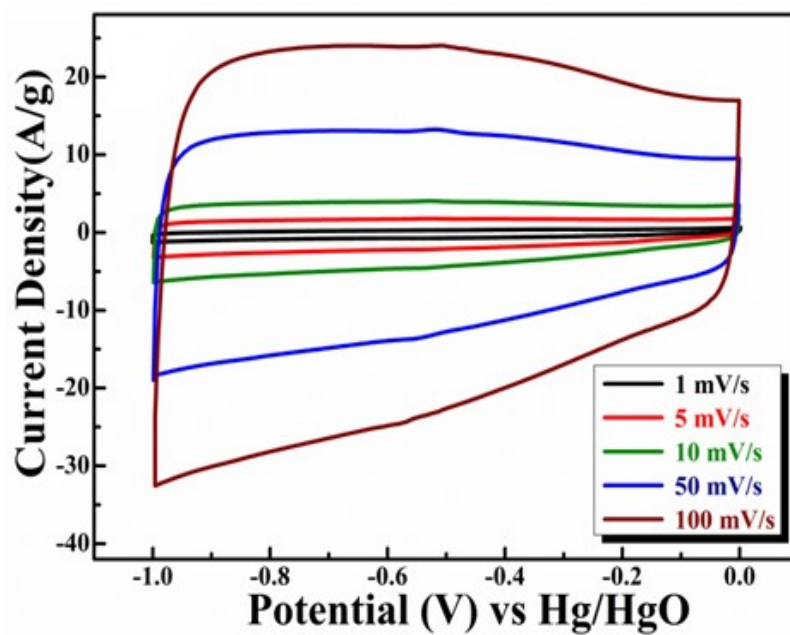
**Figure S3.** XPS plot after the complete charge-discharge cycle of Ni<sub>0.5</sub>Co<sub>0.5</sub>S nano-chains, (a) Ni (2p) spectra, (b) Co (2p) spectra, and (c) S (2p) spectra.



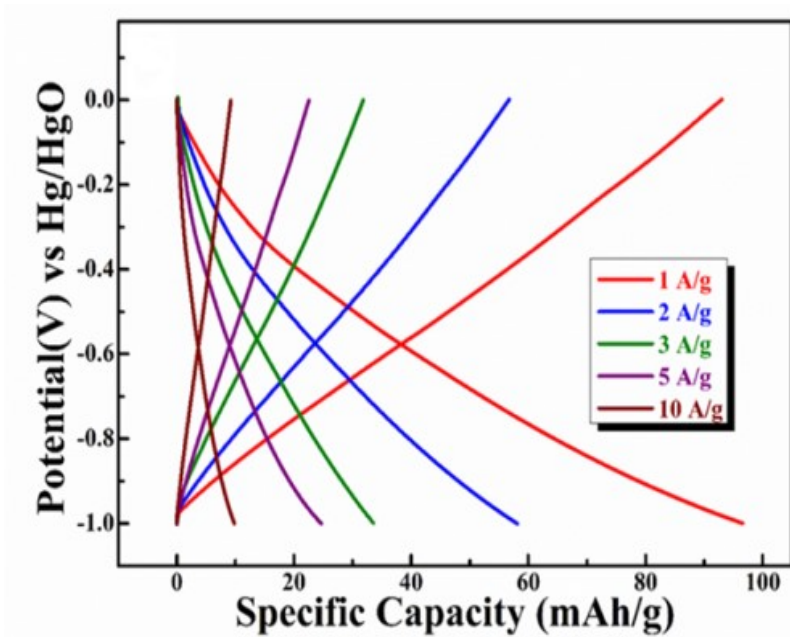
**Figure S4.** XRD plot after the complete charge-discharge cycle of  $\text{Ni}_{0.5}\text{Co}_{0.5}\text{S}$  nano-chains



**Figure S5.**  $\text{Ni}_{0.5}\text{Co}_{0.5}\text{S}$  electrode in  $0.5\text{ M Na}_2\text{SO}_4$  electrolyte: (a) CV plot and (b) GCD plot, (c) comparative CV plots of  $\text{Ni}_{0.5}\text{Co}_{0.5}\text{S}$  electrode in  $4\text{ M KOH}$  and  $0.5\text{ M Na}_2\text{SO}_4$  electrolyte at  $10\text{ mV/s}^{-1}$ , (d)  $\text{Ni}_{0.5}\text{Co}_{0.5}\text{S}$  electrode's comparative charge/discharge curve in  $\text{KOH}$  and  $\text{Na}_2\text{SO}_4$  medium.



**Figure S6.** Typical CV curves for AC electrode in 2 M KOH solutions at different scan rates of 1-100 mVs<sup>-1</sup>



**Figure S7.** Charge/discharge curve of AC electrode at different constant current density