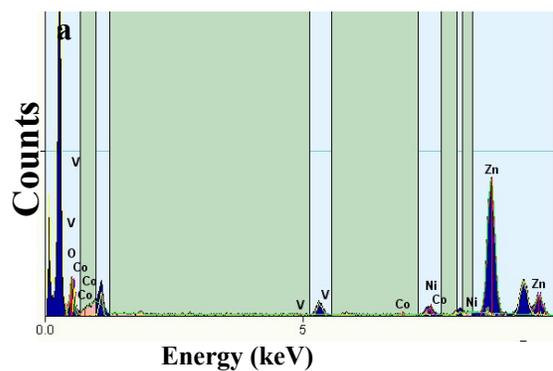


Supporting Information
for
Flexible Ternary Oxide based Solid-State Supercapacitor with
Excellent Rate Capability

Buddha Deka Boruah and Abha Misra¹

Department of Instrumentation and Applied Physics, Indian Institute of Science, Bangalore, Karnataka,
India 560012

¹ Corresponding Author: Abha Misra, Email: abha.misra1@gmail.com



Element	Atomic %
Ni	18.20
Co	11.83
Zn	40.06
O	27.9
V	2.01
Total	100

Figure S1. EDS spectrum of VZnNiCo.

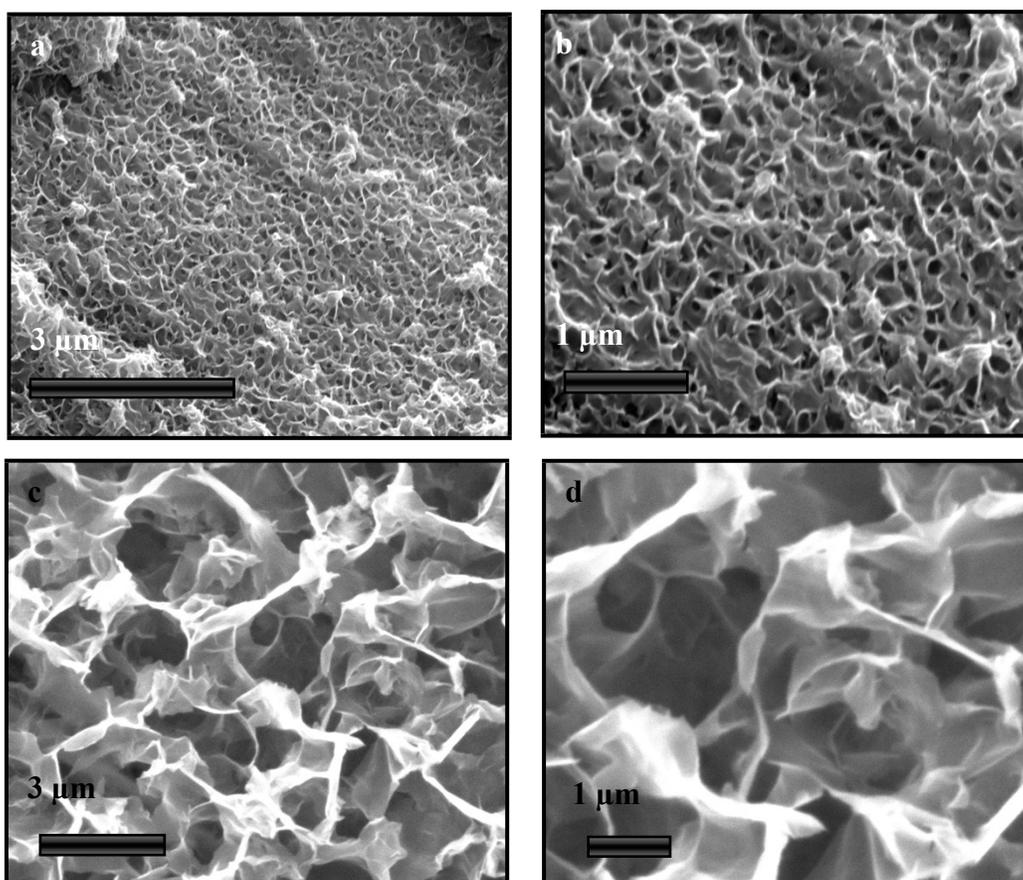


Figure S2. Microstructures of as-grown NiCo_2O_4 on NiF: (a) low and (b) high magnifications. (c) and (d) are the microstructures of ZnNiCo on NiF at low and high magnifications.

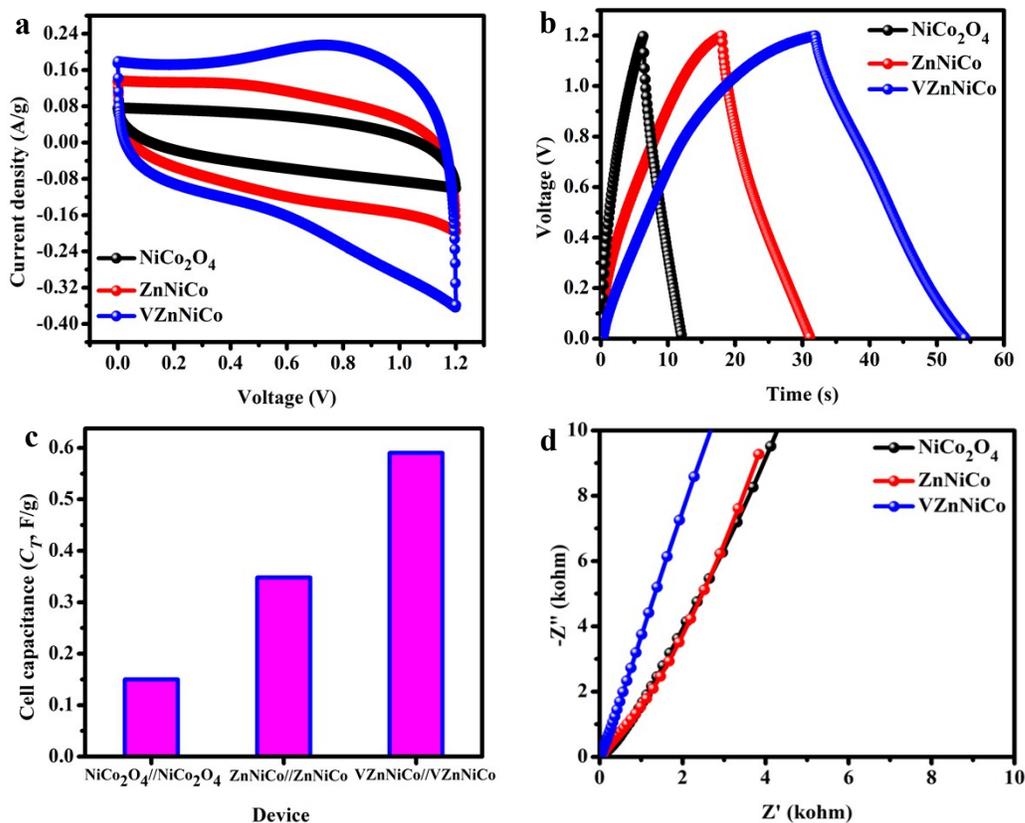


Figure S3. a) CV at scan rate of 5 V/s and b) charge-discharge at 0.032 A/g comparisons NiCo₂O₄//NiCo₂O₄, ZnNiCo//ZnNiCo and VZnNiCo//VZnNiCo SCs. c) Cell capacitance plots of all the SCs. d) Nyquist plots of all the symmetric all-solid-state SCs, NiCo₂O₄//NiCo₂O₄, ZnNiCo//ZnNiCo and VZnNiCo//VZnNiCo.

Synthesis of CdS coated ZnO NRs and device fabrication: For the growth of ZnO NRs, ZnO seed layer deposited glass sample was dipped into growth solution of equimolar 25 mM zinc nitrate hexahydrate and hexamethyleneteramine kept at 85 °C for 5 hours. Afterward, the sample was then cleaned by using ethanol and rinsed with deionized water for 5 times and finally dried at 200 °C for 1 hour in air. After growth of ZnO NRs, sample was then dipped in aqueous

solution of cadmium acetate and thioacetamide and maintained at 120 °C for 3 hours. Finally the sample was cleaned with ethanol and DI water and dried at 150 °C in air.

For the fabrication of photodetector, silver metal was used as an electrode on the top surface of CdS@ZnONRs and device schematic is provided in the main article.

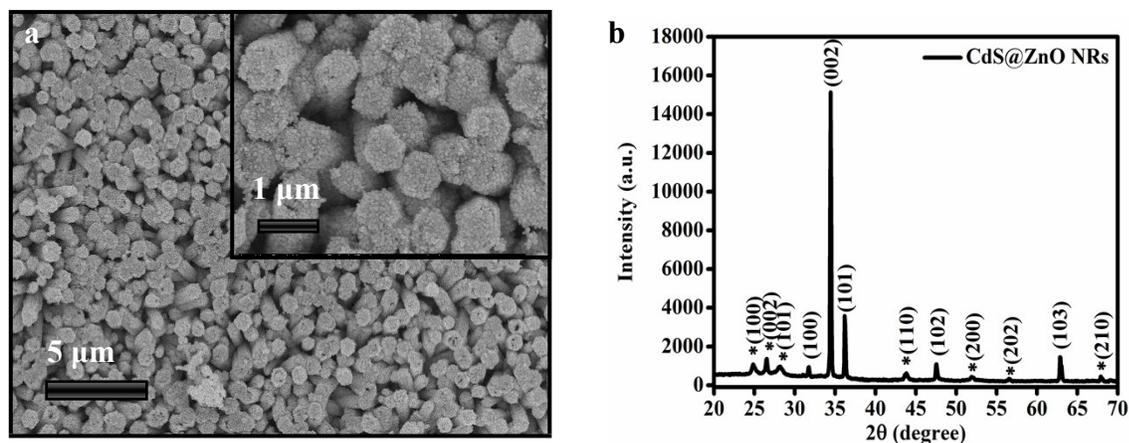


Figure S4. (a) Microstructure of as-synthesized CdS@ZnO NRs and inset shows the high magnification image. (b) XRD pattern of CdS@ZnO NRs.

The microstructure of the CdS@ZnO NRs is shown in Figure S3a and inset shows the high magnification image where uniformly coated of CdS on ZnO NRs is revealed. XRD pattern of the sample is shown in Figure S3b and the distinct appeared diffraction peaks at around $2\theta = 31.7, 34.4, 36.2, 47.5$ and 62.9° correspond to (100), (002), (101), (102) and (103) diffraction planes of wurtzite crystal structure of ZnO. The appeared additional diffraction peaks at around $24.8, 26.5, 28.1, 43.8, 52, 56.5$ and 68° corresponds to (100), (002), (101), (110), (200), (202) and (210) diffraction planes of hexagonal CdS. The observed higher intensity diffraction peak of the diffraction plane, (002) reveals that the most of ZnO NRs are vertically aligned **c**-axis

orientation. Hence, both microstructure and XRD analysis support that the successfully coated of CdS on ZnO NRs surface.