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In-situ microwave-assisted solvothermal synthesis of morphological transformation of $ZnCo_2O_4$ 3D nanoflowers and nanopetals to 1D nanowires for hybrid supercapacitors

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1. Characterization

The crystallinity and facets formation of prepared ZCO/Ni were investigated through the X-ray diffractometer (XRD; PANalytical X'Pert Pro) operating at 40 kV and 30 mA with CuKα radiation (λ =1.540 Å). The morphology features like the size and shape of the grown structures were analyzed by a field emission SEM (FE-SEM). The high-resolution images were revealed through the transmission electron microscope (HR-TEM) were recorded using a field emission electron gun in Schottky mode operating at 200 kV. N2 adsorption/desorption curves were recorded using a BET surface analyzer.

Electrochemical estimations were performed utilizing a mechanized electrochemical workstation (CHI 760 E, CH Instruments, USA) utilizing a three-anode arrangement at RT. In all tests, Ag/AgCl, Pt wire, and ZCO nanoflowers/nanowires Ni foam were utilized as the reference, counter, and working terminals, separately, and 3 M KOH arrangement was used as the dynamic/active electrolyte. Cyclic voltammetry (CV) and charge/release (CD) bends were gained and electrochemical impedance spectroscopy (EIS) was performed to explore the electrochemical exhibition of ZCO/Ni tests.