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Core-shell Structured $\text{Ni}_3\text{S}_2@ \text{Co}(\text{OH})_2$ Nano-wires Grown on Ni Foam as Binder-free Electrode for Asymmetric Supercapacitors

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Abstract: Core-shell structured $\text{Ni}_3\text{S}_2@ \text{Co}(\text{OH})_2$ nano-wires directly grown on Ni foam as a binder-free electrode for asymmetric supercapacitors are synthesized through a facile two-step process. This unique core-shell architecture consisting of ultrathin $\text{Co}(\text{OH})_2$ nano-sheets and Ni_3S_2 nano-wires exhibits significantly enhanced electrochemical capacitive performance. The $\text{Ni}_3\text{S}_2@ \text{Co}(\text{OH})_2$ electrode demonstrates high specific capacitance of 2139.4 F g^{-1} at the current density of 2 mA cm^{-2} , and retains capacitance of 1139.4 F g^{-1} at a much higher current density of 40 mA cm^{-2} . An asymmetric supercapacitor using $\text{Ni}_3\text{S}_2@ \text{Co}(\text{OH})_2$ as cathode and active carbon as

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