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# $ZnMoS_4$ nanorods grown on Ni foam for high performance hybrid-supercapacitors

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Supercapacitors, also known as electrochemical capacitors, are a new type of energy storage device which bridges the gap between rechargeable batteries and conventional dielectric capacitors. Batteries and supercapacitors are currently the primary choices offering reliable and convenient accessible energy storage. As for energy storage devices, electrochemical supercapacitors provide a higher power density and modest energy density as compared with batteries. Recently, carbon-based nanomaterial, such as activated carbon, carbon nanotubes, carbon nanofibers and graphene has been studied for supercapacitor electrodes. Among them, activated carbons are still attractive because of its low cost and well-established electrochemical properties. Metal oxides and their composites have become attractive in various applications for new generation nano-electronic devices including supercapacitors and lithium-ion batteries. Among these, metal sulfides are also known to be electrochemically active materials for supercapacitor applications. $ZnMoS_4$ nanorods were successfully synthesized on 3D-Ni-foam (NF) by one step hydrothermal process. The $ZnMoS_4$ nanorod grown on NF delivers good specific capacitance. The hybrid-supercapacitor with splendid electrochemical performance is rationally demonstrated by employing $ZnMoS_4$ and activated carbon as the positive and negative electrode respectively. Hybrid-supercapacitor shows good energy density, power density and excellent cycling stability. These results suggested that the binder free $ZnMoS_4$ nanorods are a suitable battery type positive electrode for high-performance hybrid-supercapacitors.

## Biography

Awais Ali is a PhD student in the School of Chemical Engineering, Yeungnam University, Republic of Korea. His research focuses on energy storage devices, especially supercapacitors. His work is on improving the energy storage capacity using different metal sulfides. His research focuses on making materials that can store more energy and can show long cycling stability (charge-discharge).

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