Understandings of synergestic role of 2D interlayer for electrochemcial energy stoarge electrode

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Nowadays, development of efficient electrochemical energy storage system is a key issue of research exercises to store available energy and use it as per demand. Among the various challenges of electrochemical energy storage system, we focus on the stability issue of electroactive materials. Particularly, transition metal sulfide@reduced graphene oxide hybrid electrodes with simple and facile hydrothermal synthesis have been investigated to understand the role two dimensional (2D) reduced graphene oxide. Our experiments and analysis demonstrated that, 'surface properties of reduced graphene oxide simultaneously control, the nanostructure growth, inter-particle resistances and inter-particle interactions within the electroactive material'. Thus, the controlled surface properties of 2D materials offered synergistic effects to stabilize transition metal sulfide along with the improved energy storage capacitance, which can be effectively extended for other electroactive materials.