Two-dimensional hybrid material $NiCo_2S_4$@MoS_2@rGO with enhanced performance for supercapacitors

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The combined nanosheet materials, such as graphene and molybdenum disulfide (MoS_2) can enhance the performance of electrochemical energy storage devices remarkably when covered with the third material like $NiCo_2S_4$ due to the high surface area and high electrical conductivity. By adding $NiCo_2S_4$, the material has a good specific capacitance but unstable stability. With the appearance of MoS_2, hybrid material can have the capacitance retention of 110 % after 500 cycles at a current density of 5 A/g. Furthermore, the specific capacitance was up to 432 F/g at current density 3 A/g.