

Supplementary Information

Compact graphene/MoS₂ composite films for highly flexible and stretchable all – solid – state supercapacitors

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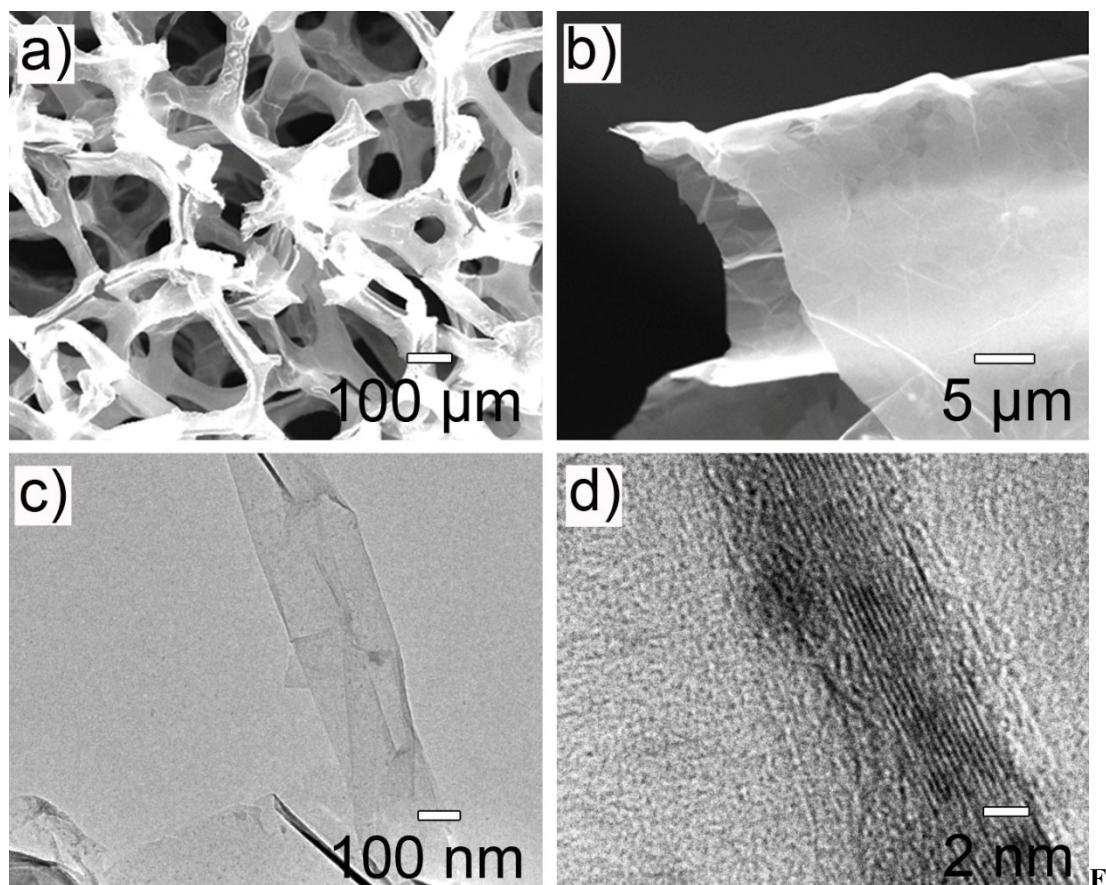


Fig. S1 (a,b) SEM images of as-grown graphene foam after removed Ni substrate with different magnifications. (c,d) TEM images of bare graphene.

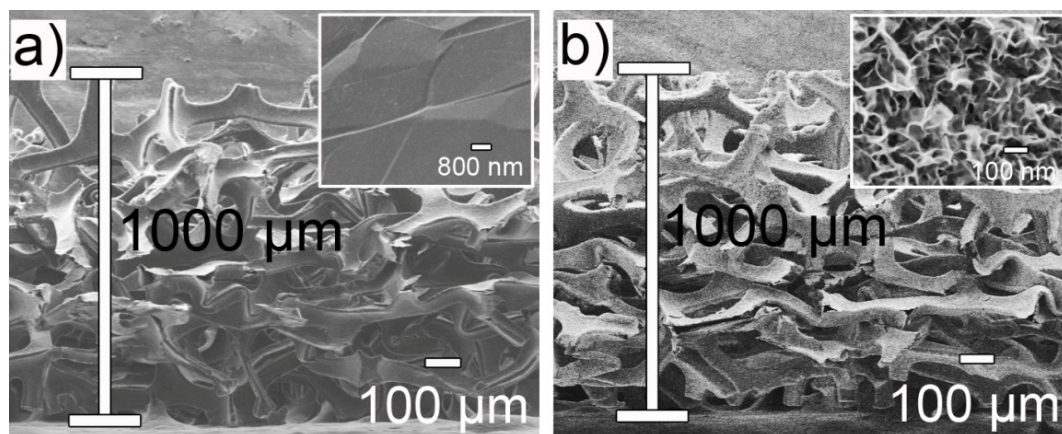


Fig. S2 Cross-sectional SEM images of as-synthesized bare graphene and graphene/MoS₂ foams.

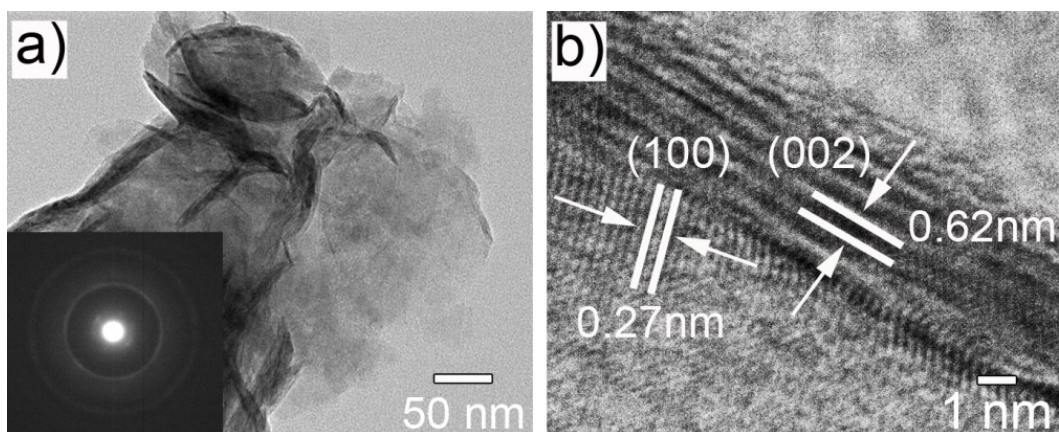


Fig. S3 TEM images of MoS₂ nanosheets. Inset in (a) showed the electron diffraction pattern.

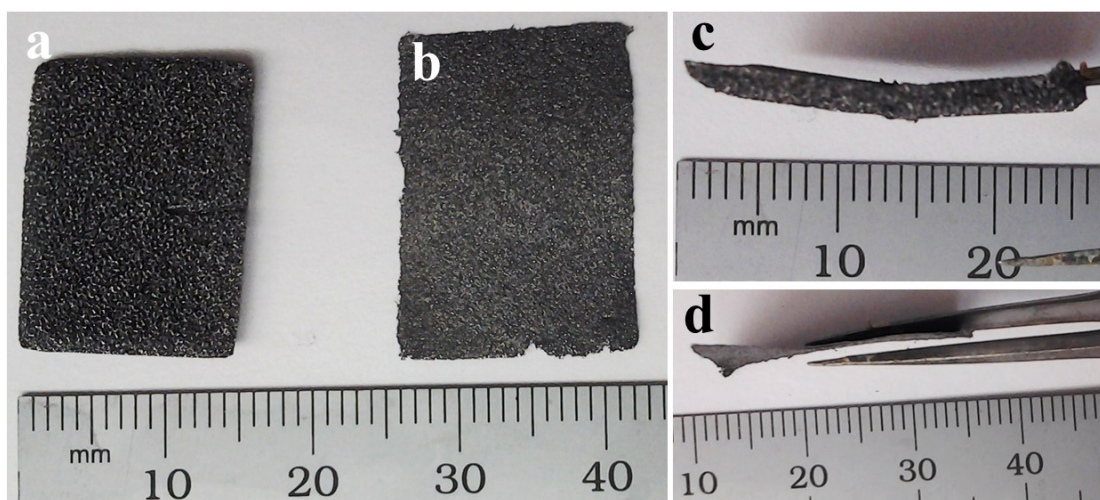


Fig. S4 (a, b) Digital photographs of dry graphene foam before (a) and after (b) pressing. (c, d) Digital photographs of dry graphene foam before (c) and after (d) pressing from side view.

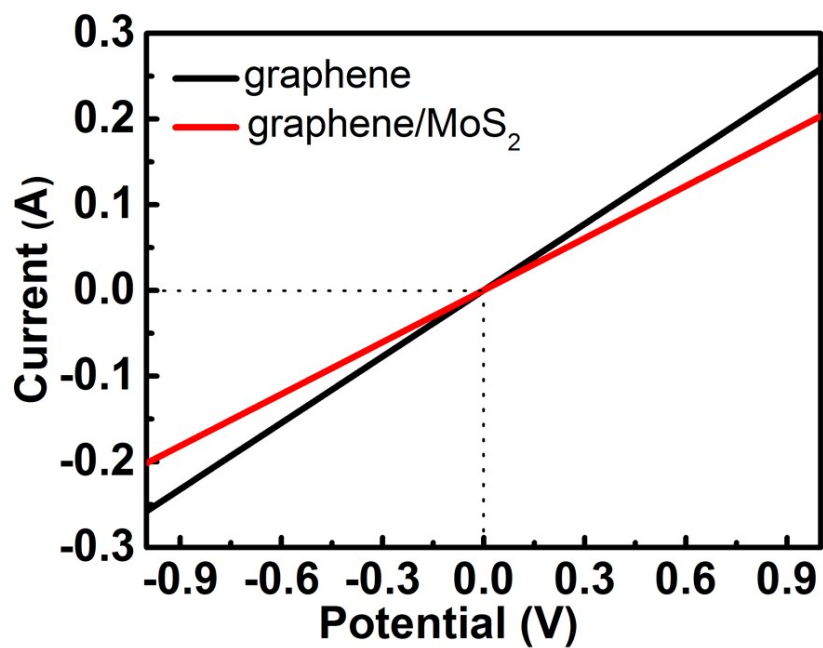


Fig. S5 I-V curves of bare graphene film and with graphene/MoS₂ composite film. The effective length of samples measured was 2 cm.

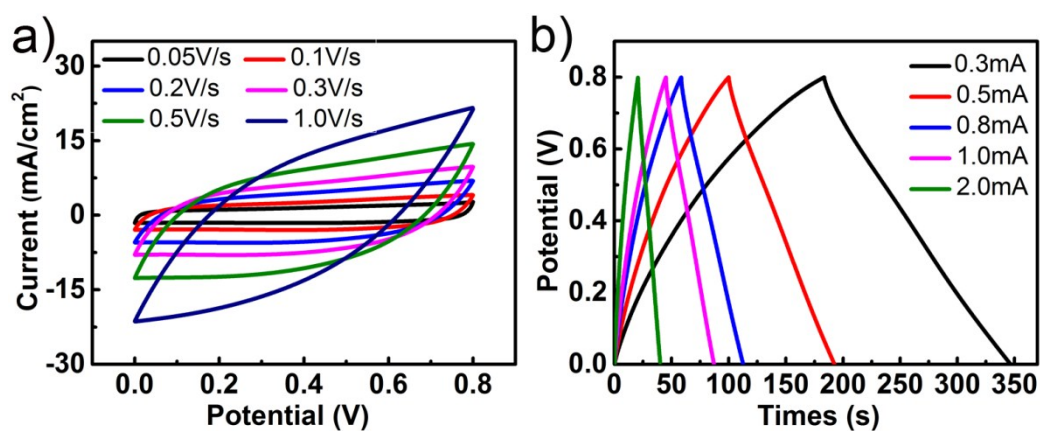


Fig. S6 (a) CV curves of an all-solid-state supercapacitor based on graphene/MoS₂ composite films with 35.0 wt% of MoS₂ at various scanning rates. (b) GCD curves of the supercapacitor measured under different charge - discharge currents.

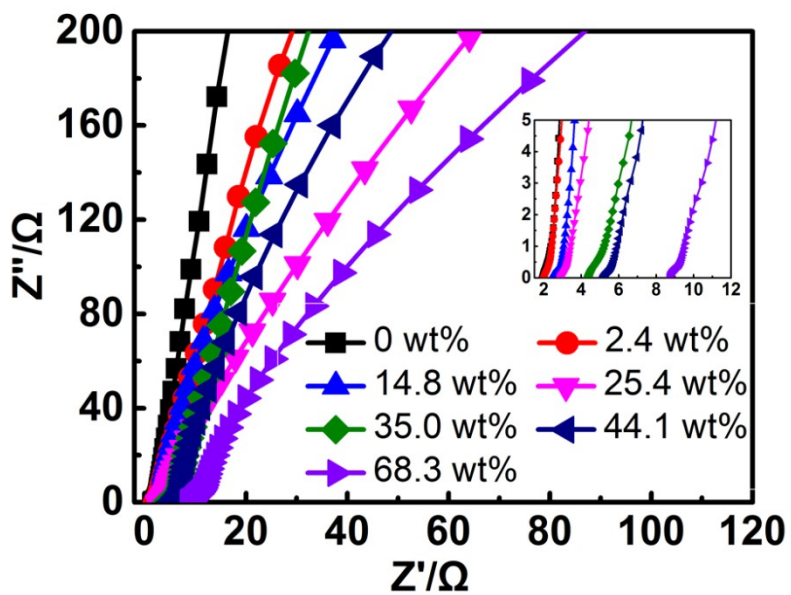


Fig. S7 Nyquist plots of supercapacitors based on graphene/MoS₂ composite films with different MoS₂ contents (0, 2.4, 14.8, 25.4, 35.0, 44.1, and 68.3 wt%) recorded in a frequency range from 10⁻² to 10⁵ Hz.

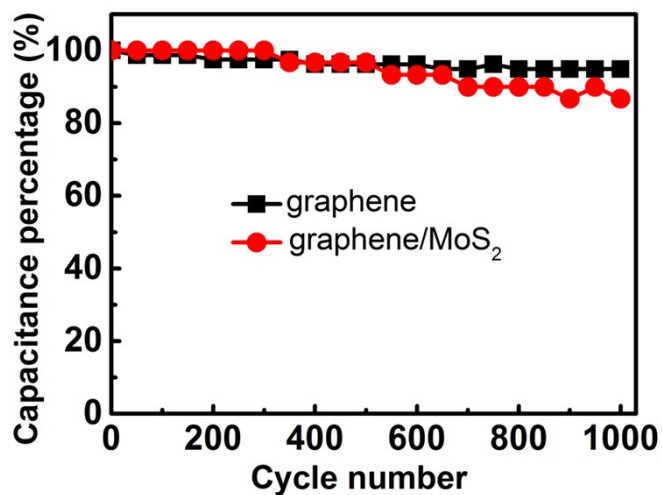


Fig. S8 Cycling performance of supercapacitors based on bare graphene and graphene/MoS₂ composite films.

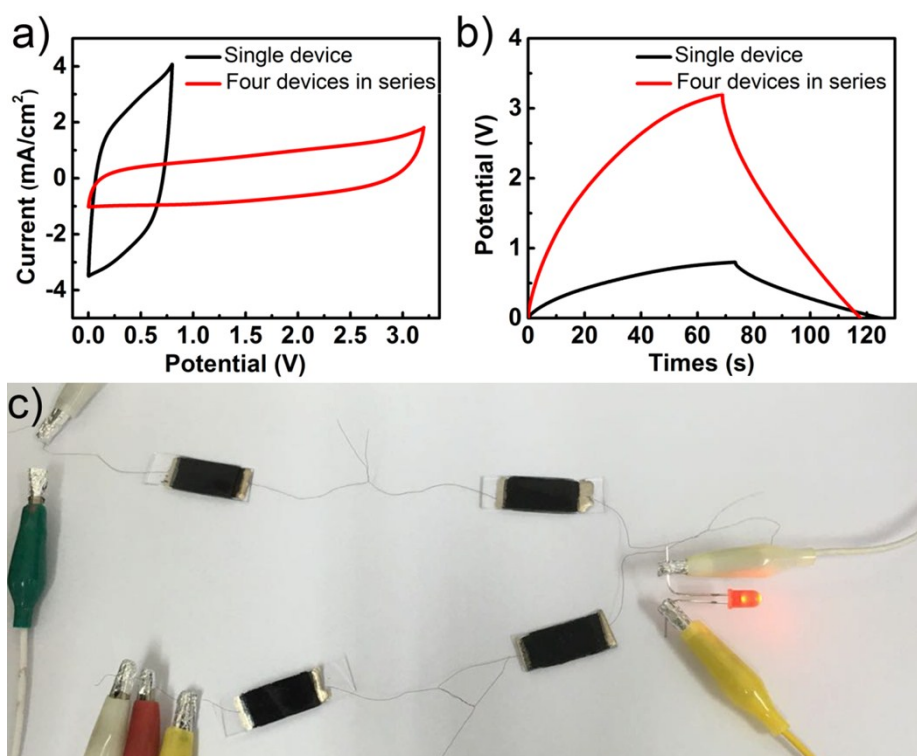


Fig. S9 (a) CV curves of one single supercapacitor and four supercapacitors connected in series at the scan rate of 0.1 V/s. (b) Galvanostatic charge–discharge curves of one single supercapacitor and four supercapacitors connected in series at a constant charge – discharge current of 1.0 mA. (c) Digital photograph of four supercapacitors connected in series to power a red LED.

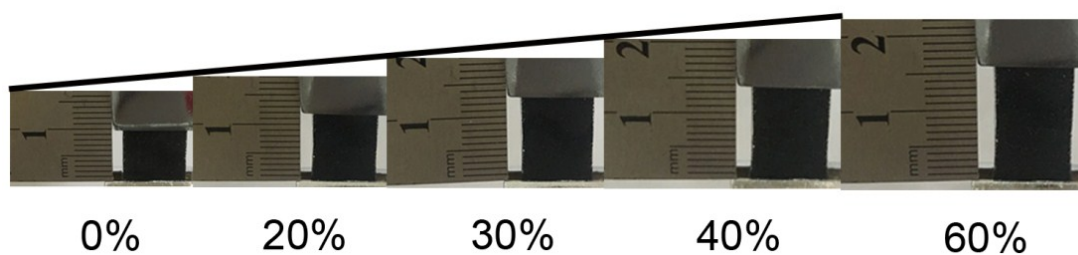


Fig. S10 Digital photographs of a supercapacitor being stretched from 0 to 60% strain.

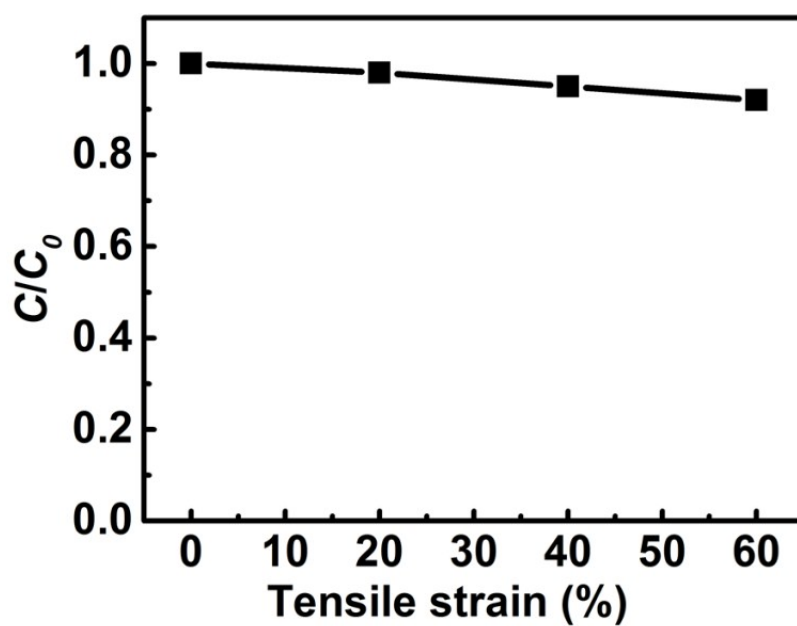


Fig. S11 Normalized specific capacitance of a supercapacitor based on graphene/MoS₂ composite films as a function of tensile strains.

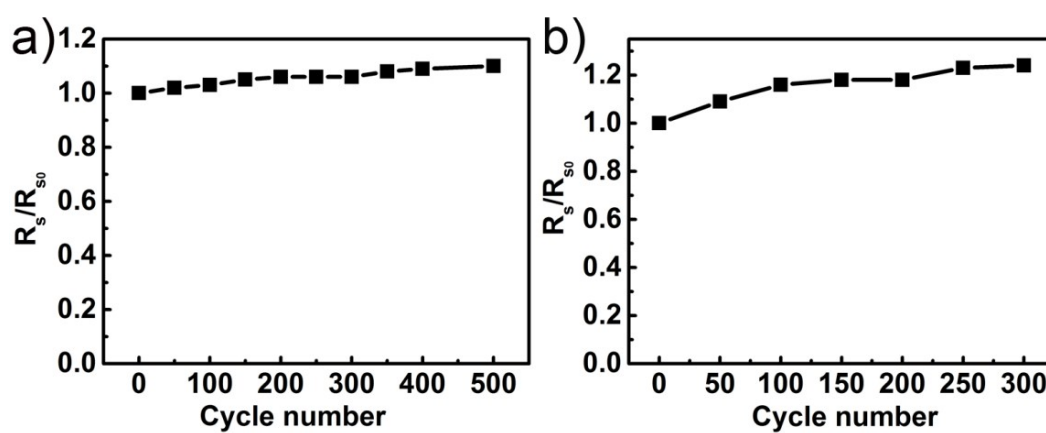


Fig. S12 (a) Dependence of series resistances of a graphene/MoS₂ - based supercapacitor on the bending cycles. (b) Dependence of series resistance of a graphene/MoS₂ - based supercapacitor on the stretching cycles to tensile strain of 30%.

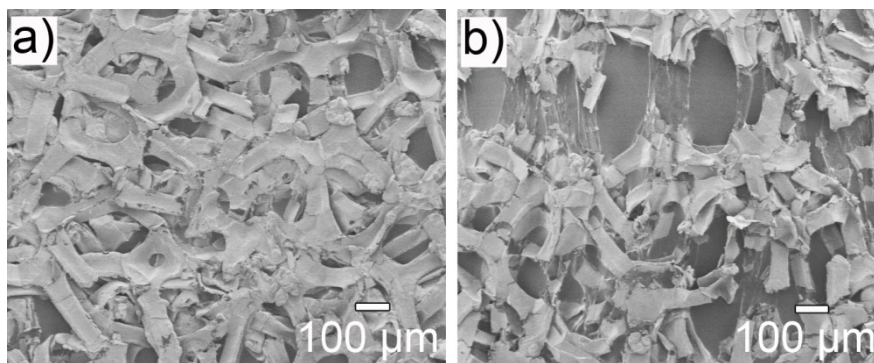


Fig. S13 SEM images of graphene/MoS₂ composite film before (a) and after (b) stretched.