Supplementary Information for

Electroactive Nanoparticle Directed Assembly of Functionalized Graphene Nanosheets into Hierarchical Structures with Hybrid Compositions for Flexible Pseudocapacitors

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Table S1. Textural properties of CMGN, CMGN/RuO_2, and CMGNR films.

Samples	Pore size (nm)	Surface area ($m^2\ g^{-1}$)	Pore volume ($cm^3\ g^{-1}$)
CMGN	5.82	9.56	0.04
CMGN/RuO_2	4.98	179.56	0.11
CMGNR	3.83	494.05	0.49

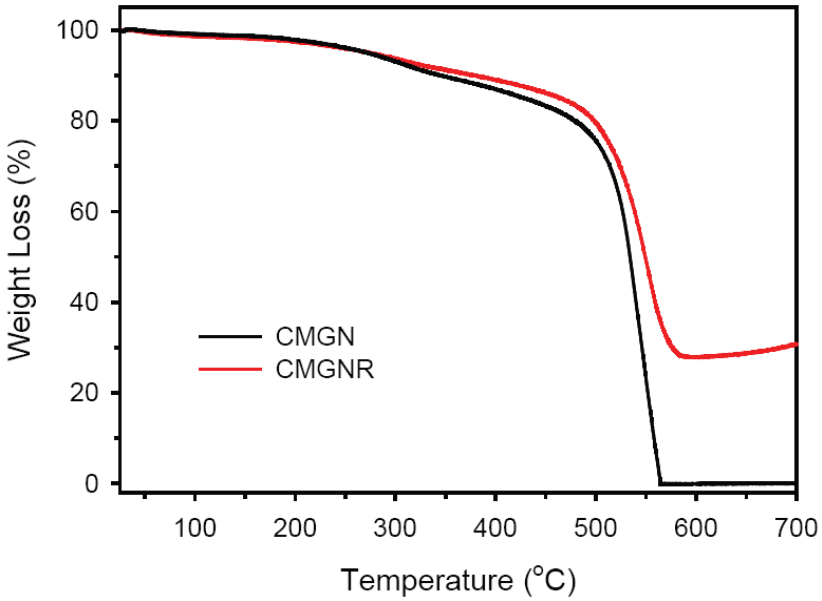

Fig. S1 TGA curves of CMGN and CMGNR hybrids.

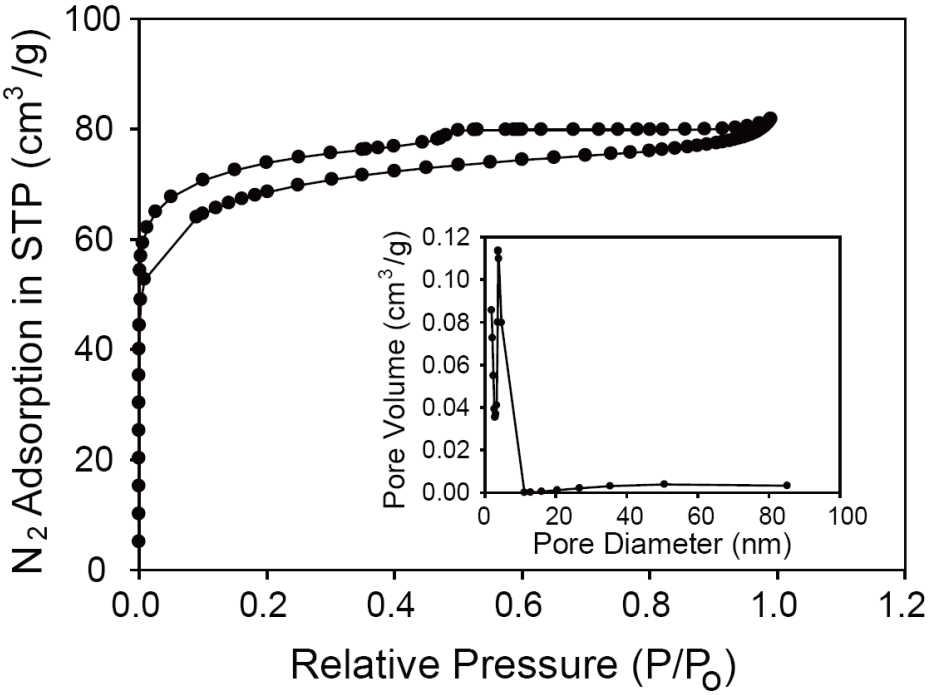

Figure S2. N_2 adsorption/desorption isotherms and pore size distribution of CMGNR.

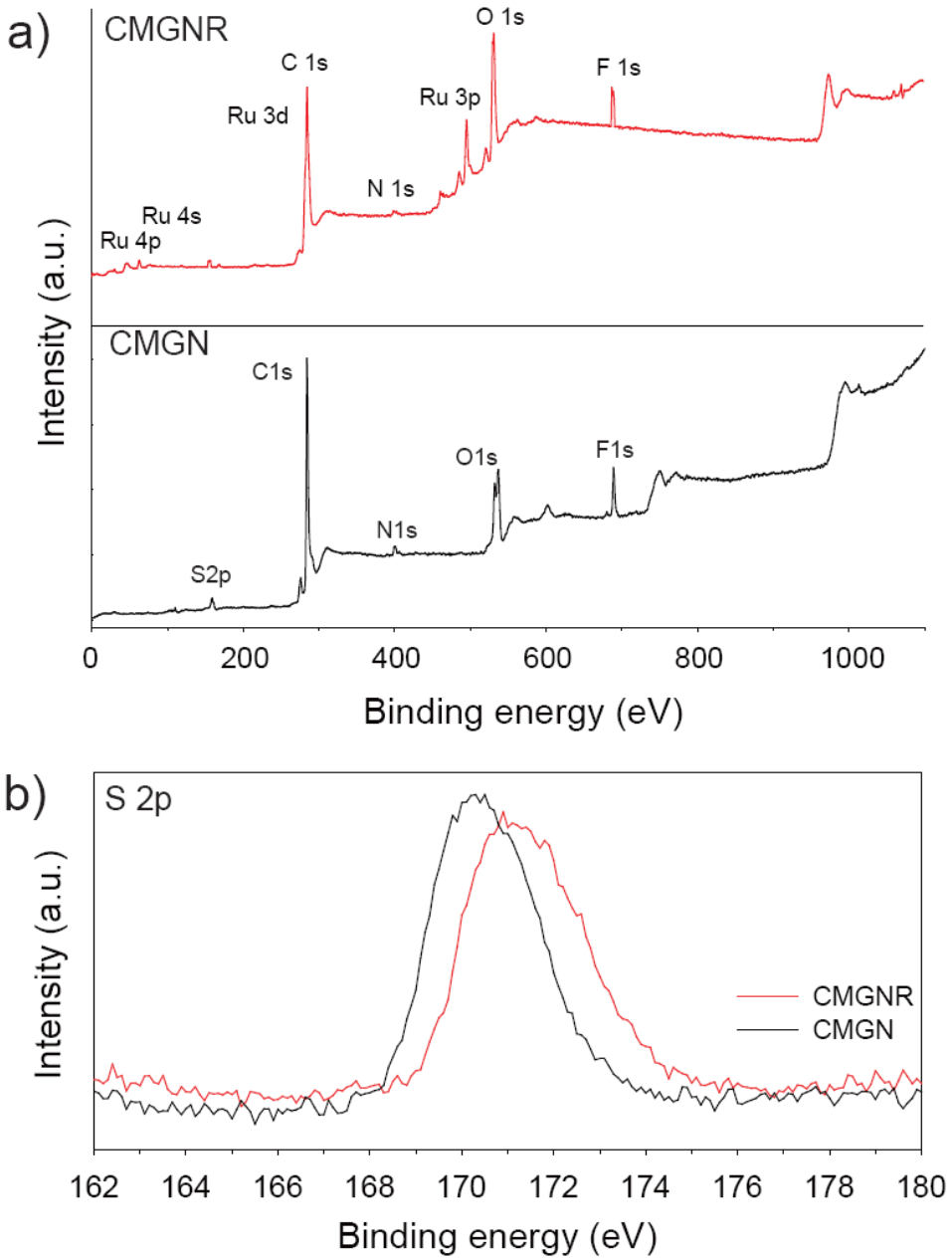

Fig. S3 (a) XPS survey spectra and (b) S 2p XPS spectra of CMGN and CMGNR hybrids.

The formation of RuO_2 on CMGN was confirmed by XPS results. When compared to the bare CMGN sample, the CMGNR composites exhibited new Ru 4p, Ru 4s, Ru 3d, and Ru 3p peaks, thereby indicating the formation of RuO_2 on the composites. In addition, the S 2p peak of CMGN was observed at 170.2 eV, which is assigned to the sulfur in the $–SO_3H$ groups from the Nafion. In contrast, CMGNR showed the shifted peak of S 2p at 171.7 due to the mutual interactions between the $–SO_3H$ groups and RuO_2.

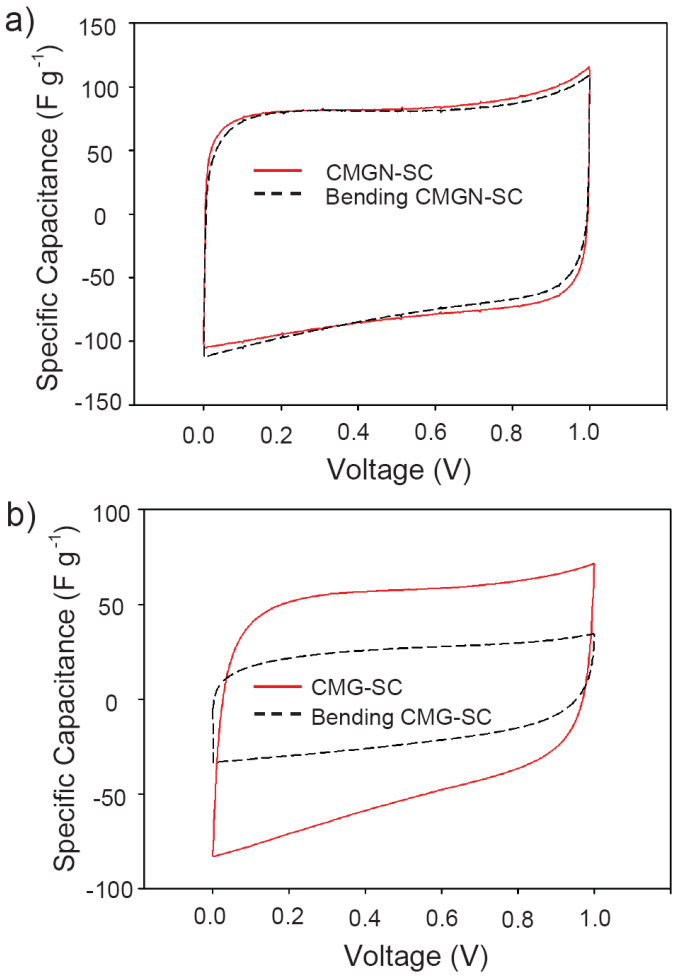

Fig. S4 Cyclic voltammograms of (a) CMGN-SC and (b) CMG-SC at the bent and relaxed states with scan rate of 100 mV/s.

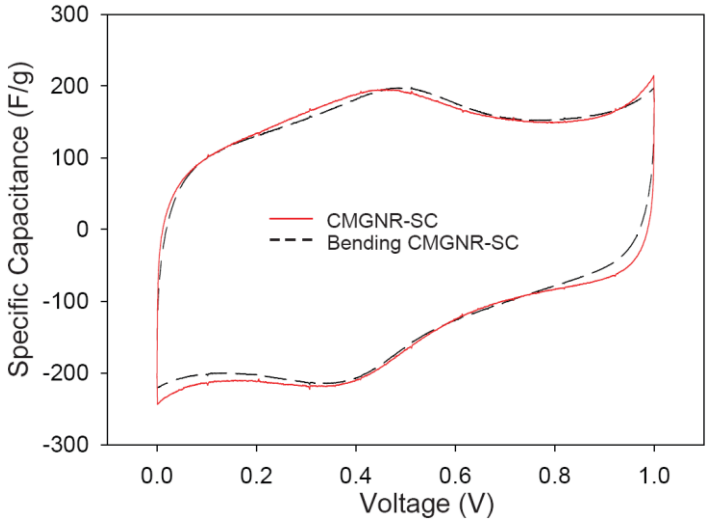

Fig. S5 Cyclic voltammograms of CMGNR-SC at the bent and relaxed states with scan rate of 100 mV/s.

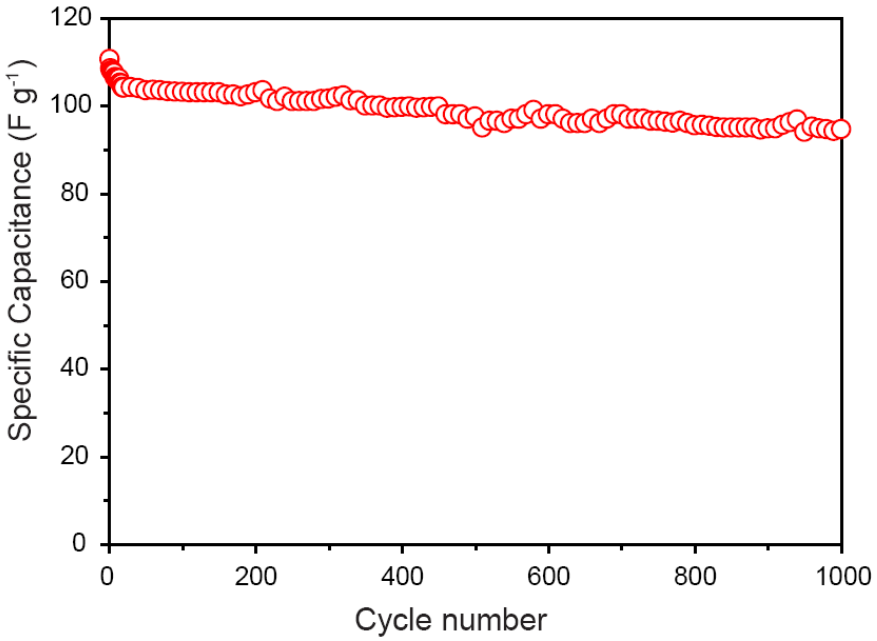

Fig. S6 Durability test of CMGN/RuO_2-SC with galvanostatic charge–discharge at a constant current 1 A/g.

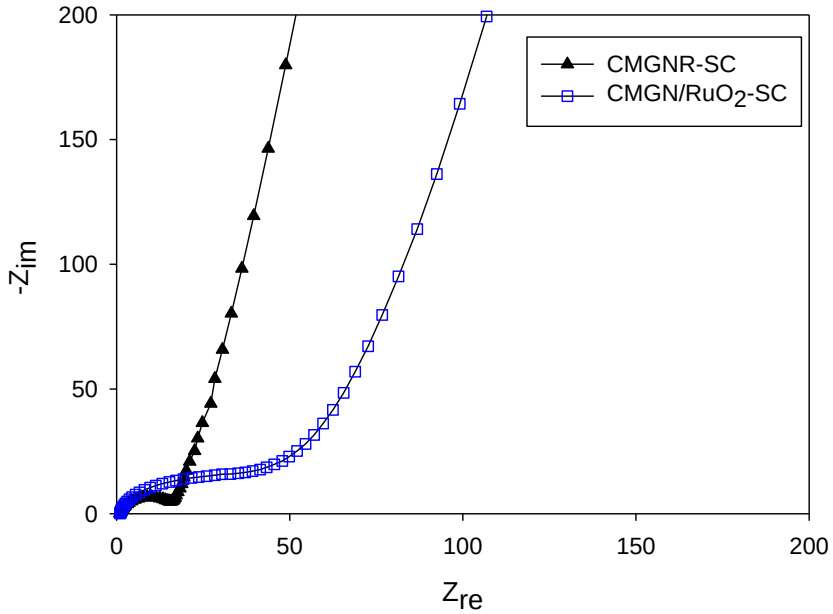

Fig. S7 Impedance spectrum of CMGNR-SC and CMGN/RuO_2-SC.