Supplementary data

Constructing $MoS_2/CoMo_2S_4/Co_3S_4$ nanostructure supported by graphene layers as anode for lithium-ion batteries

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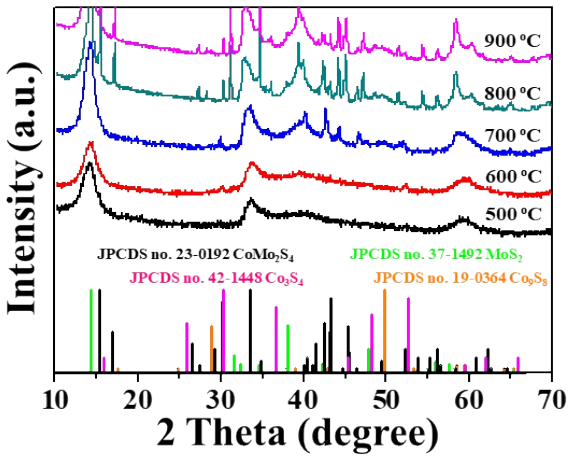

Fig. S1. XRD images of MCC-x

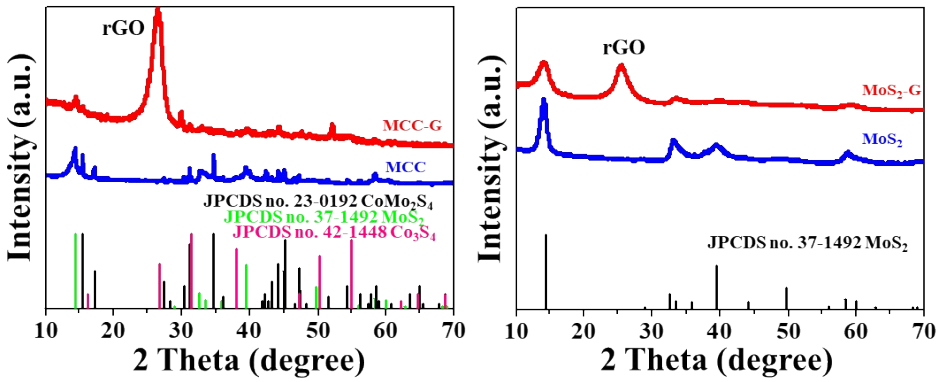

Fig. S2 XRD patterns of MCC, MCC-G, MoS_2 and MoS_2-G

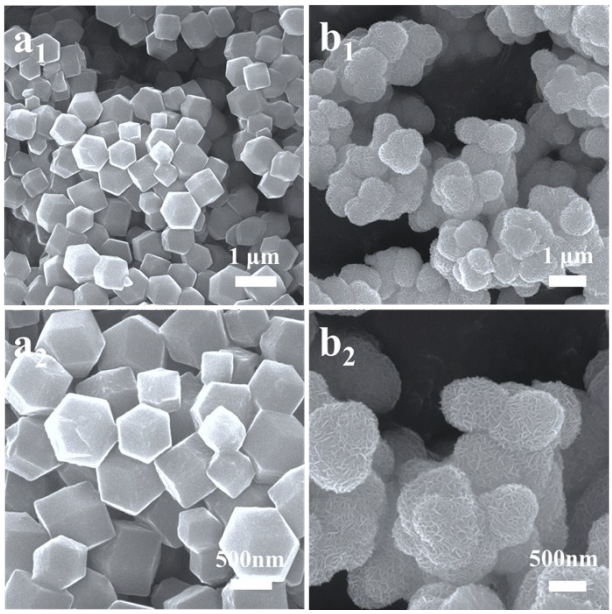

Fig. S3. SEM images of (a_1, a_2) ZIF-67 and (b_1, b_2) MoS_2@ZIF

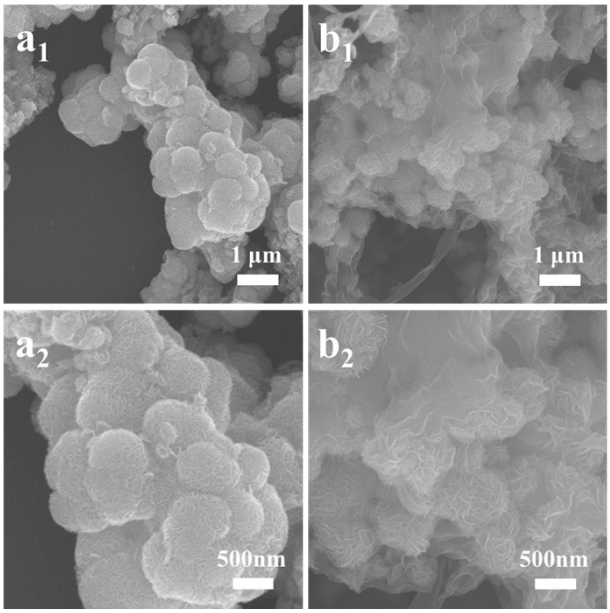

Fig. S4. SEM images of (a_1, a_2) pure MoS_2 and (b_1, b_2) MoS_2-G.

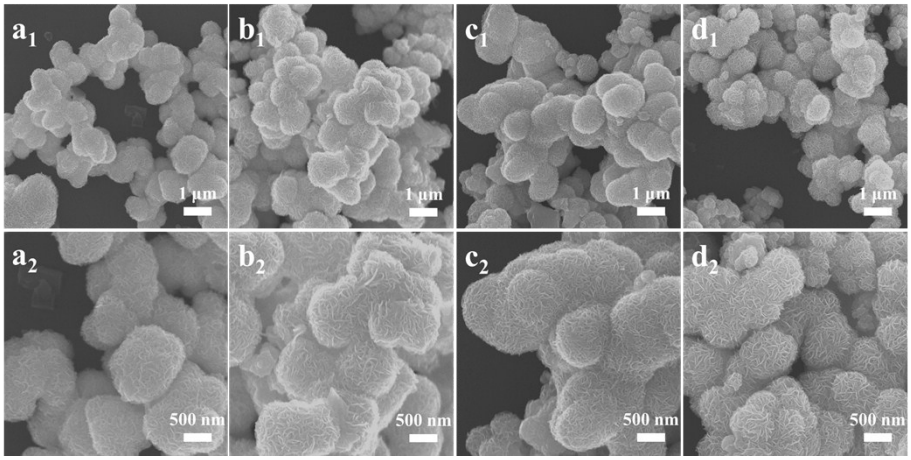

Fig. S5. SEM images of (a_1, a_2) MCC-500, (b_1, b_2) MCC-600, (c_1, c_2) MCC-700, and (d_1, d_2) MCC-900.

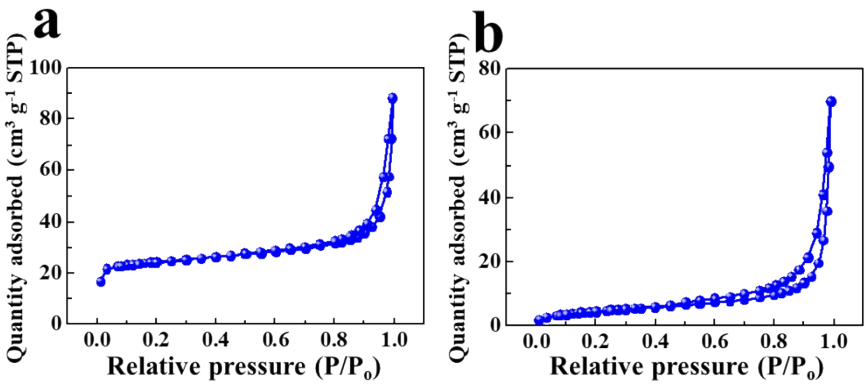

Fig. S6. BET tests of (a) MCC-G, (b) MCC

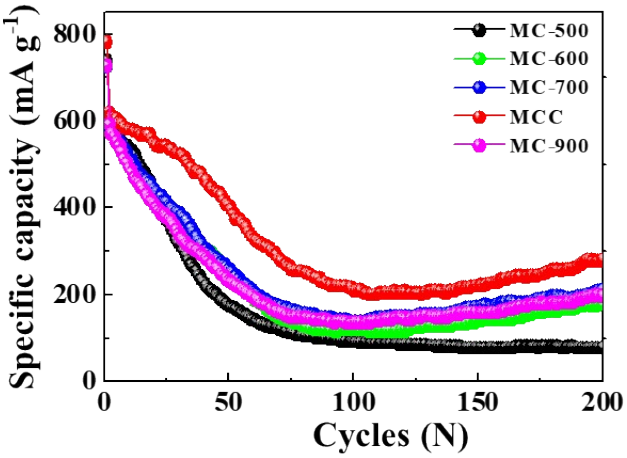

Fig. S7. Cycle performance of MCC-x at 0.2 A g^{-1}

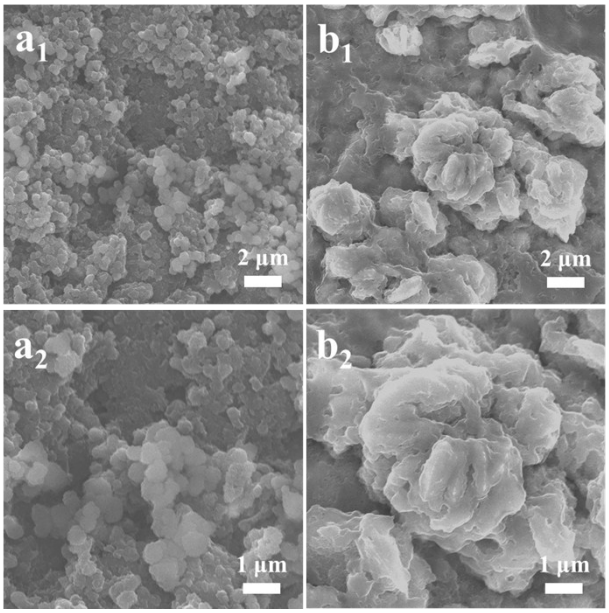

Fig. S8 SEM images of (a_1, a_2) MCC-G and (b_1, b_2) MoS_2-G after cycling at 2A g^{-1}

Table S1 Comparison of rate capability and specific capability of various metal sulfide-based anode materials

Materials	Rate capability (mAh g^{-1})	Capacity (mAh g^{-1})	Ref.
MCC-G	360 (10 A g^{-1})	770 (0.2 A g^{-1})	**This work**
MoS2/MXene	182 (2 A g^{-1})	520 (0.1 A g^{-1})	*Angew. Chem. Int. Ed. 2018, 57, 1846 –1850*
Co9S8@MoS2	403 (2 A g^{-1})	300 (2 A g^{-1})	*Small 2017, 13, 1603490*
C_3N_4/NRGO/MoS_2	130 (8 A g^{-1})	938 (0.2 A g^{-1})	*Nano Energy 2014, 8, 157–164*
MoS2-reduced graphene oxide	350 (1 A g^{-1})	800 (0.1 A g^{-1})	*Adv. Funct. Mater. 2017, 27, 1700234*
NDG/MoS2/NDG	416 (4 A g^{-1})	750 (0.1 A g^{-1})	*Nano Energy 2017, 41, 154–163*
MoS2-TiO2	511 (2 A g^{-1})	806 (0.1 A g^{-1})	*Nano Energy 2017, 33, 247–256*
GF@CNT@MoS2	229 (5 A g^{-1})	935 (0.1 A g^{-1})	*Chem. Eng. J. 2018, 353, 419-424*
TiO2/MoS2	200 (10 A g^{-1})	410 (1 A g^{-1})	*Chem. Eng. J. 2018, 345, 320-326*
CoS2-CoS-C	411 (1 A g^{-1})	446 (0.1 A g^{-1})	*Nano energy 2016, 26, 466*
Co4S3@PANI	189 (2 A g^{-1})	184 (4 A g^{-1})	*J. Mater. Chem. A 2016, 4, 5505*
N-doped carbon@CoS nanotubes	396 (3 A g^{-1})	396 (3 A g^{-1})	*Angew. Chem. Int. Ed. 2016, 55, 15831*
Peapod-like CoS@C nanowires	235 (5 A g^{-1})	381 (0.1 A g^{-1})	*Adv. Mater. 2016, 28, 7276*