Electronic Supplementary Material (ESI) for Journal of Materials Chemistry A.

Supporting Information

Composite of Few-layer MoO_3 Nanosheets with Graphene as a High Performance Anode for Sodium-ion Batteries

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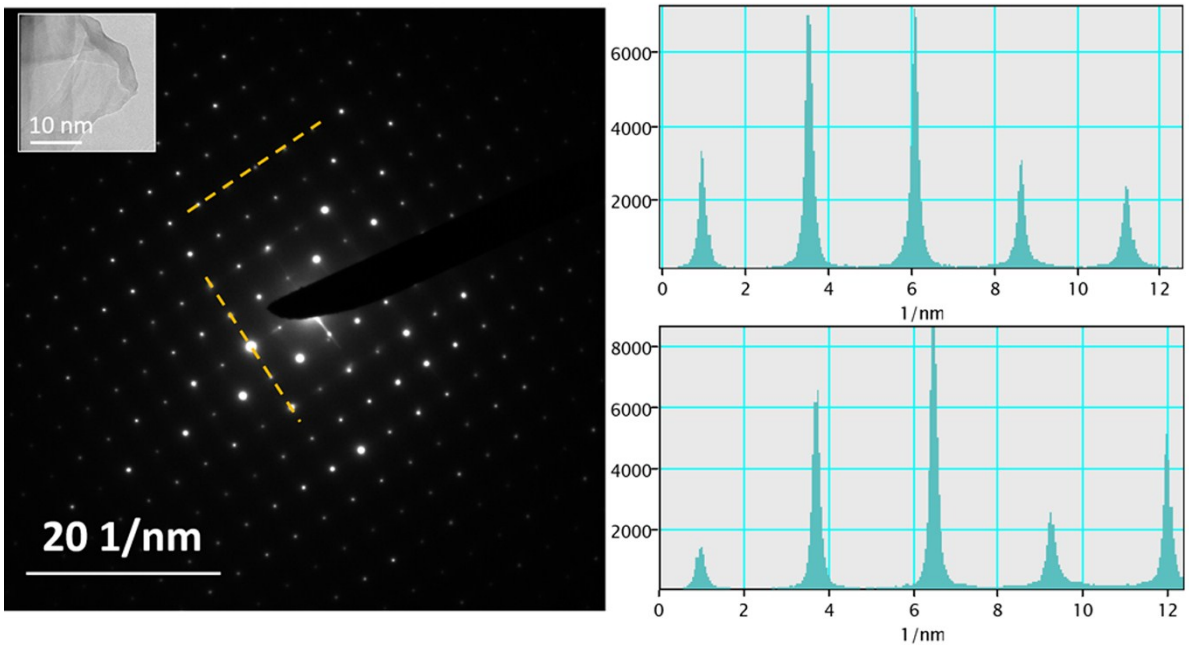

Fig. S1 Selected area electron diffraction (SAED) pattern of few-layer MoO_3 nanosheet (inset) showing orthorhombic patterns and corresponding line profile.

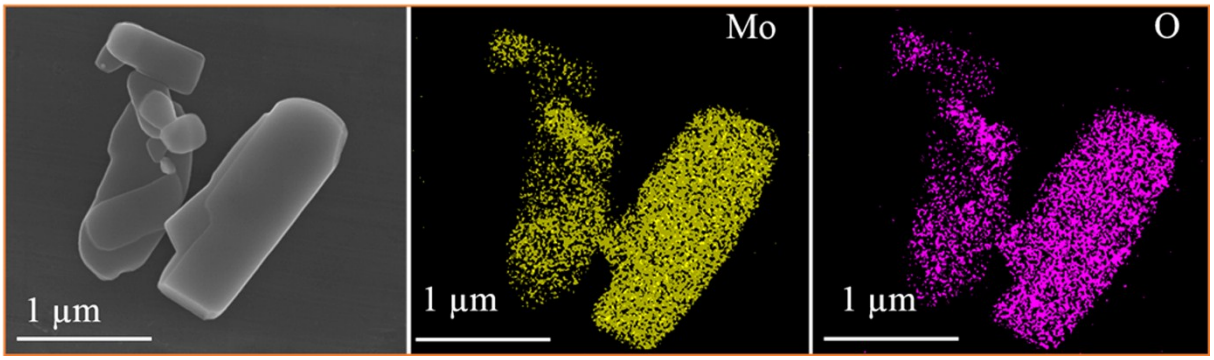

Fig. S2 FESEM image of few-layer MoO_3 and corresponding **e**lemental mapping of Mo (yellow) and O (pink).

Fig. S2 shows the EDAX elemental mapping of few-layer MoO_3 nanosheets obtained in FESEM. We have chosen the large area to make sure the distribution of Mo and O. The Mo and O are uniformly distributed throughout the nanosheets revels the wide range of homogeneous composition.

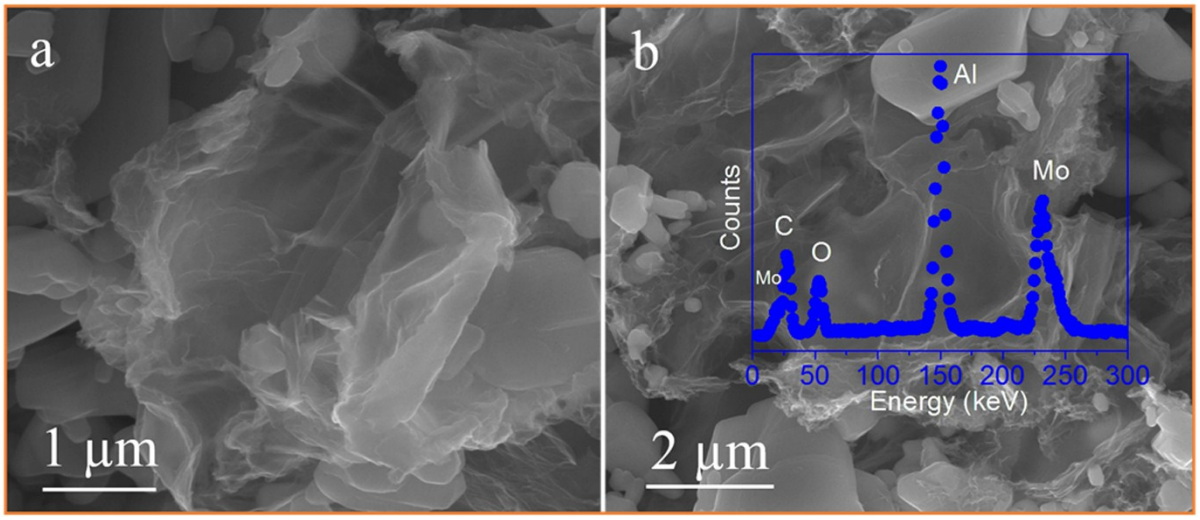

Fig. S3 FESEM images of few-layer MoO_3-rGO composite (10 wt%). Inside of (b) shows EDAX spectra corresponding Mo, O and C.

Fig. S3 shows the FESEM images of the few-layer MoO3-rGO composite (10wt%). The samples shows uniform coverage of rGO on the MoO_3 flakes this helps in the conductivity of the sample. EDAX spectra shows the peaks corresponds to Mo, O as well as C which confirms the composites are very uniform and homogeneous. The strong Al peak in EDAX spectrum corresponds to the substrate. The samples are drop coated on Al substrate for FESM analysis

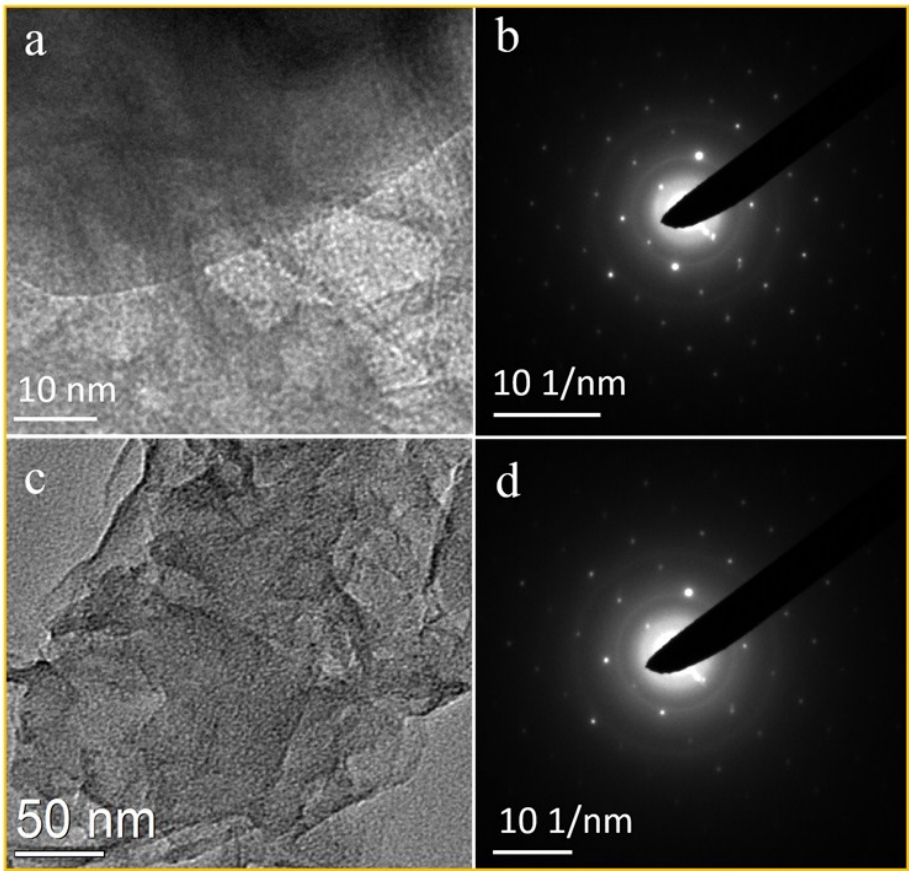

Fig. S4 TEM images of Few-layer MoO_3-rGO composite (a, c) and corresponding electron diffraction patterns (b, d).

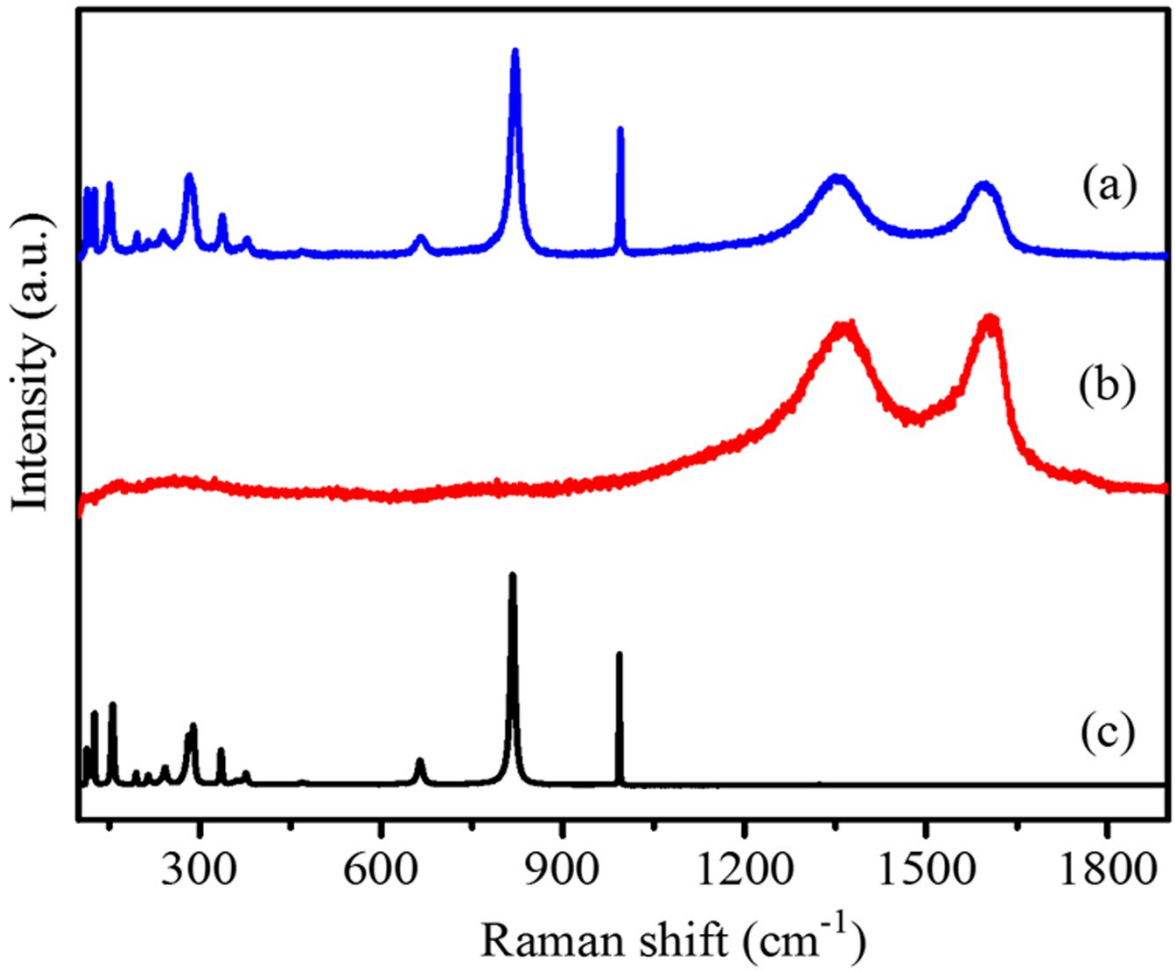

Fig. S5 Raman spectra of **(a)** MoO_3-rGO composite (10 wt%), **(b)** rGO and **(c)** few-layer MoO_3.

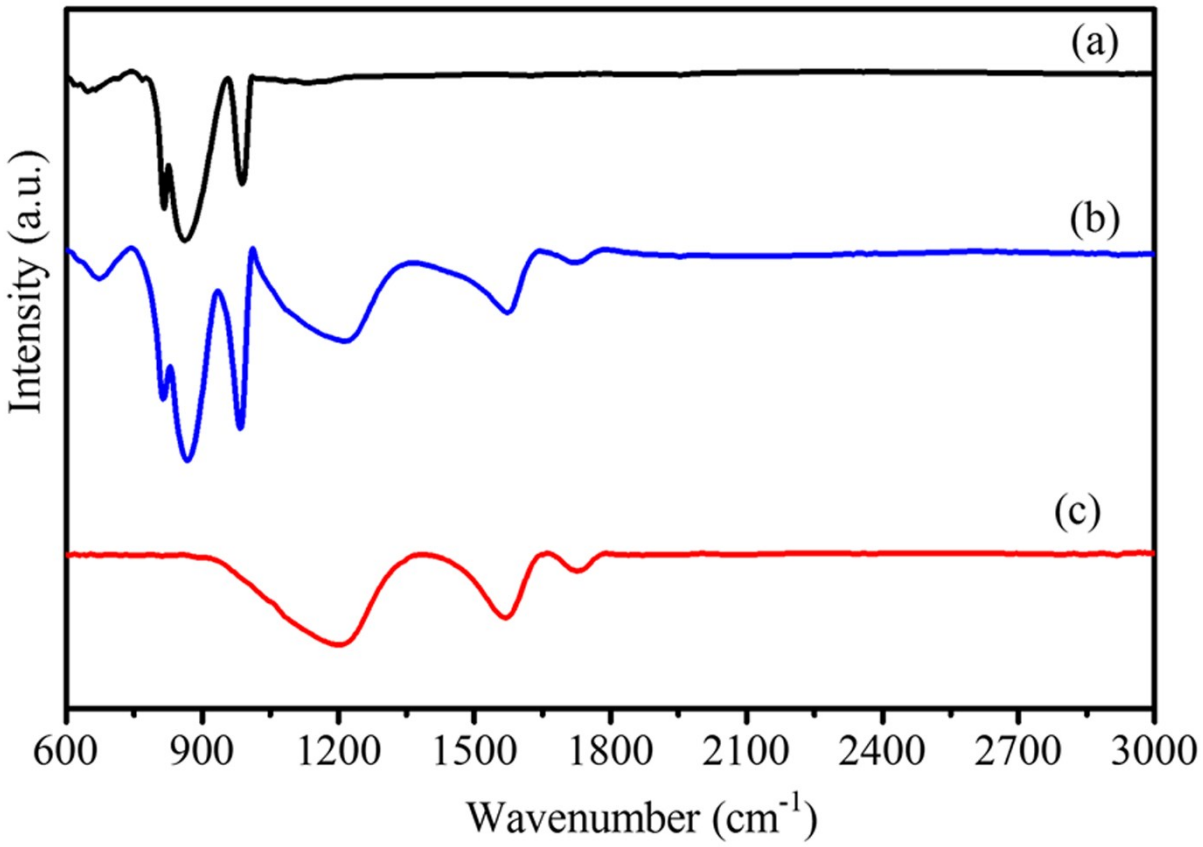

Fig. S6 Fourier transform infrared spectrum of **(a)** few-layer MoO_3, **(b**) few-layer MoO_3-rGO composite (10 wt%) and **(c)** rGO.

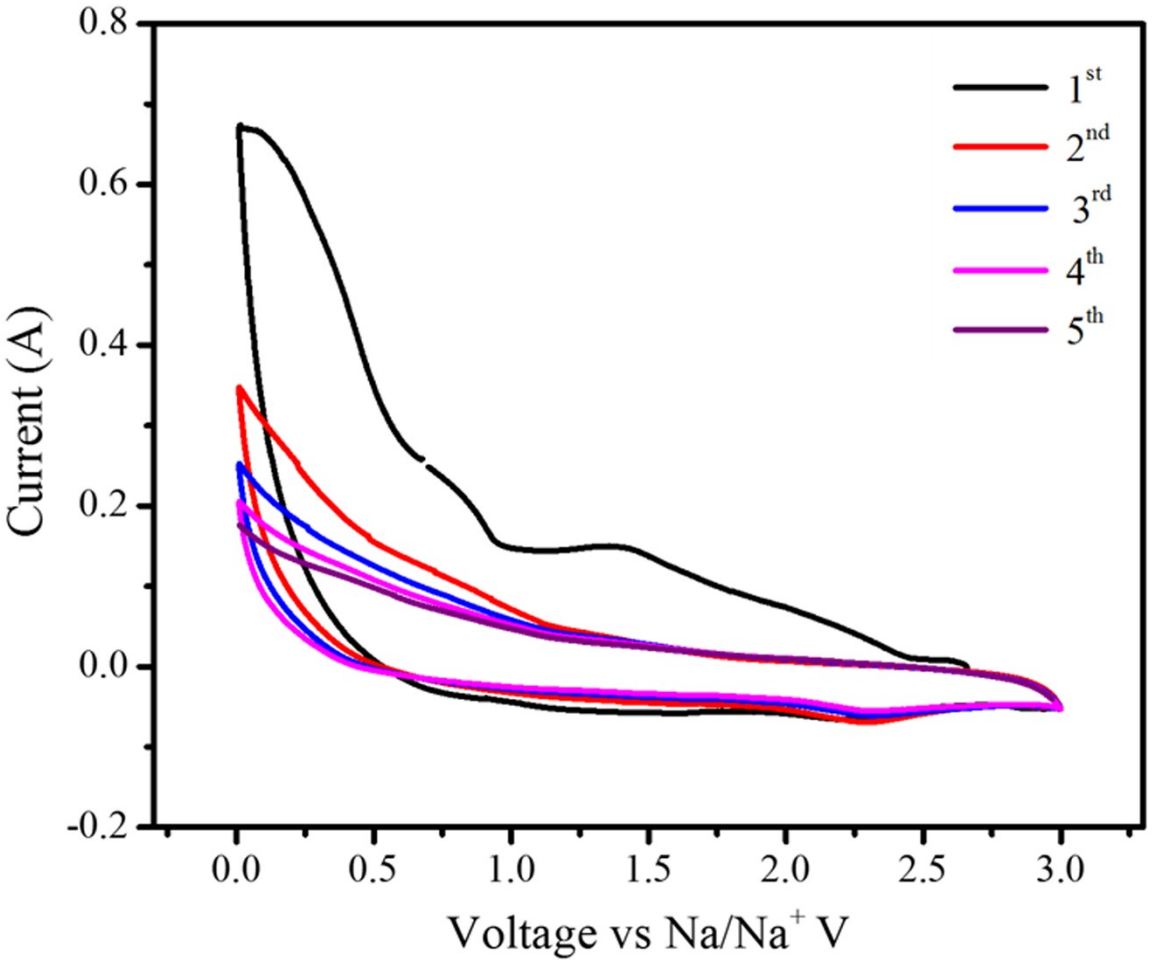

Fig. S7 Cyclic voltammetry for few-layer MoO_3-rGO composite (10wt%).

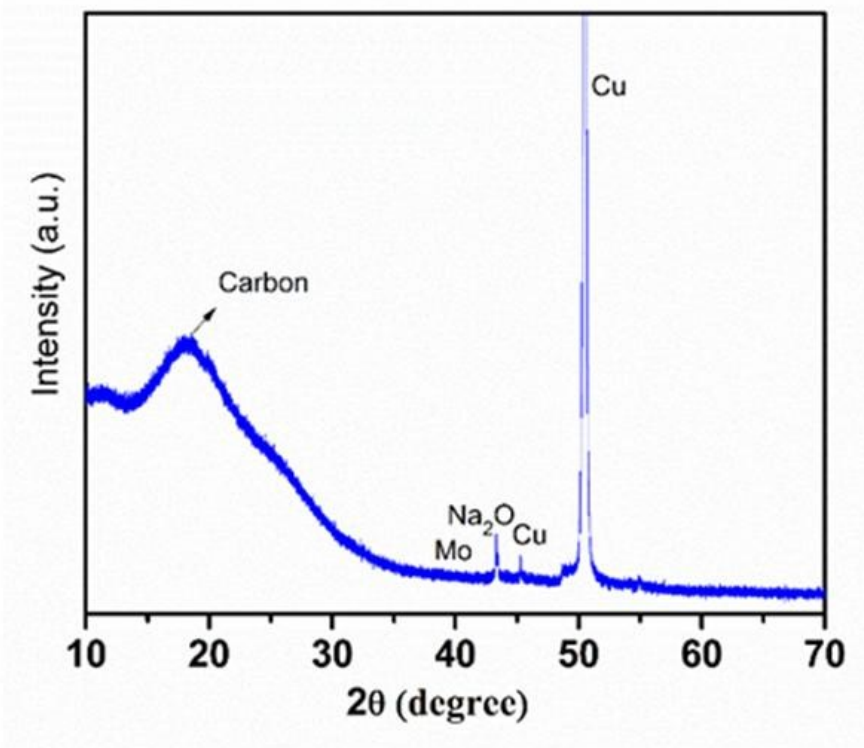

Figure S8: *ex-situ* XRD of the MoO_3-rGO electrode after 1st discharge.

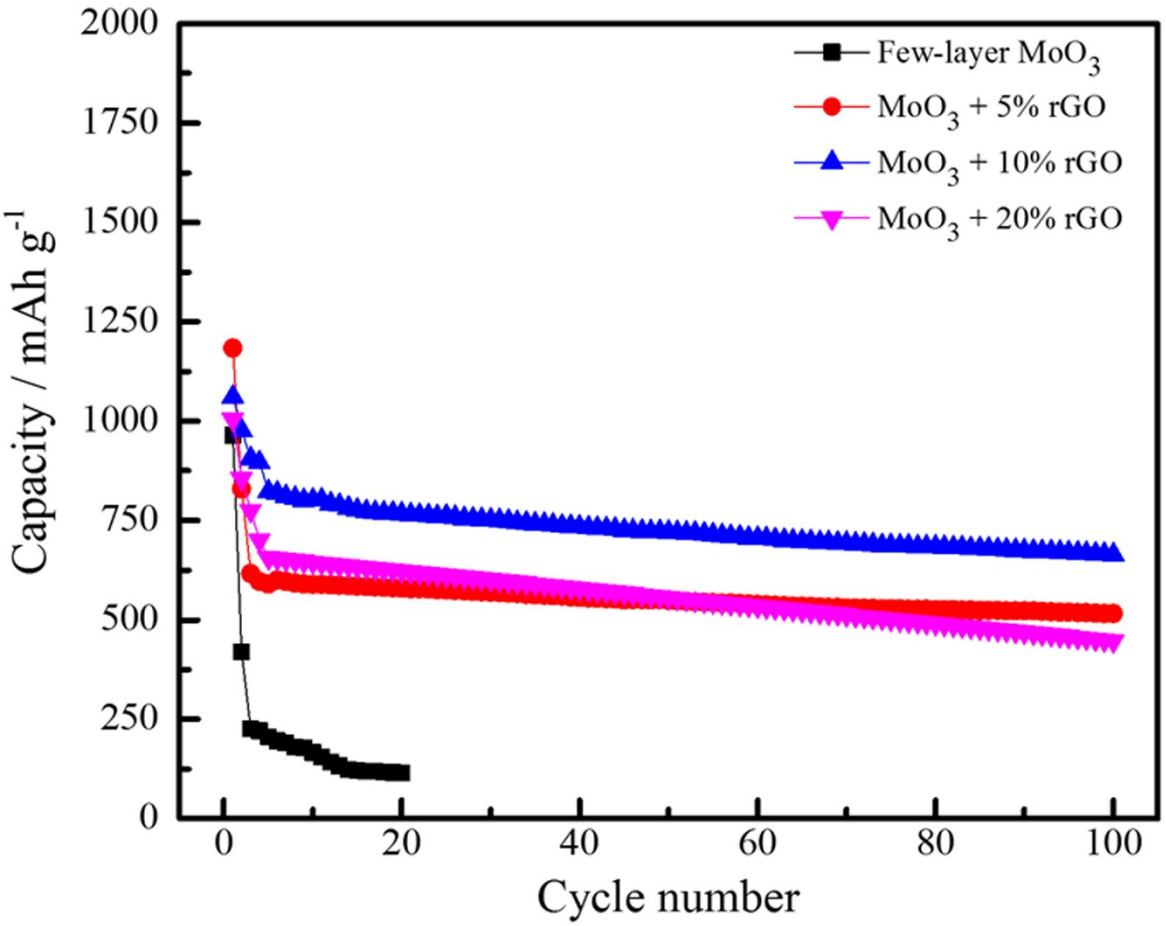

Fig. S9 Na-discharge specific capacity of few-layer MoO_3-rGO composites (5-20 wt%) and few-layer MoO_3.

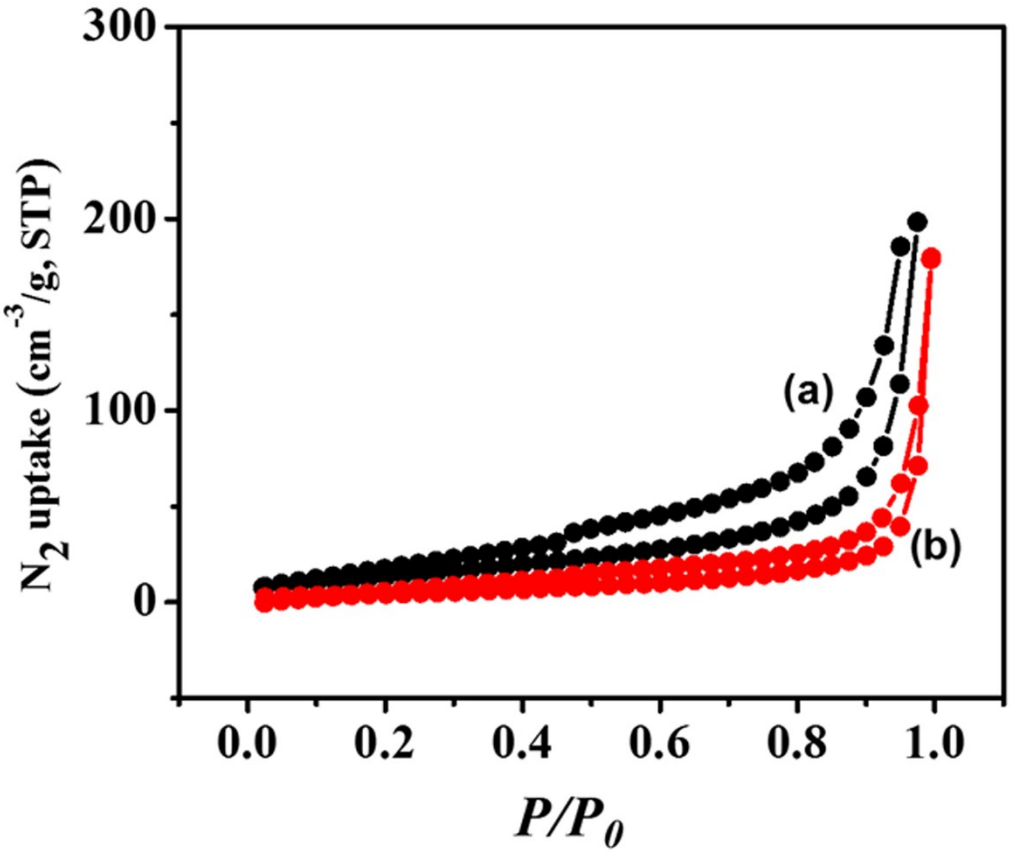

Fig. S10 N_2 sorption profile of (a) few-layer MoO_3-rGO (10 wt%) composite and (b) few-layer MoO_3.

Nitrogen adsorption-desorption isotherm data of few-layer MoO_3 and MoO_3-rGO composites recorded at 77K are shown in Fig. S9. The isotherm exhibits type-3 behavior with H3 type hysteresis loop. The Brunauer-Emmet-Teller (BET) surface areas of few-layer MoO_3 and MoO_3-rGO composites are 42 and 58 m^2g^{-1} respectively.