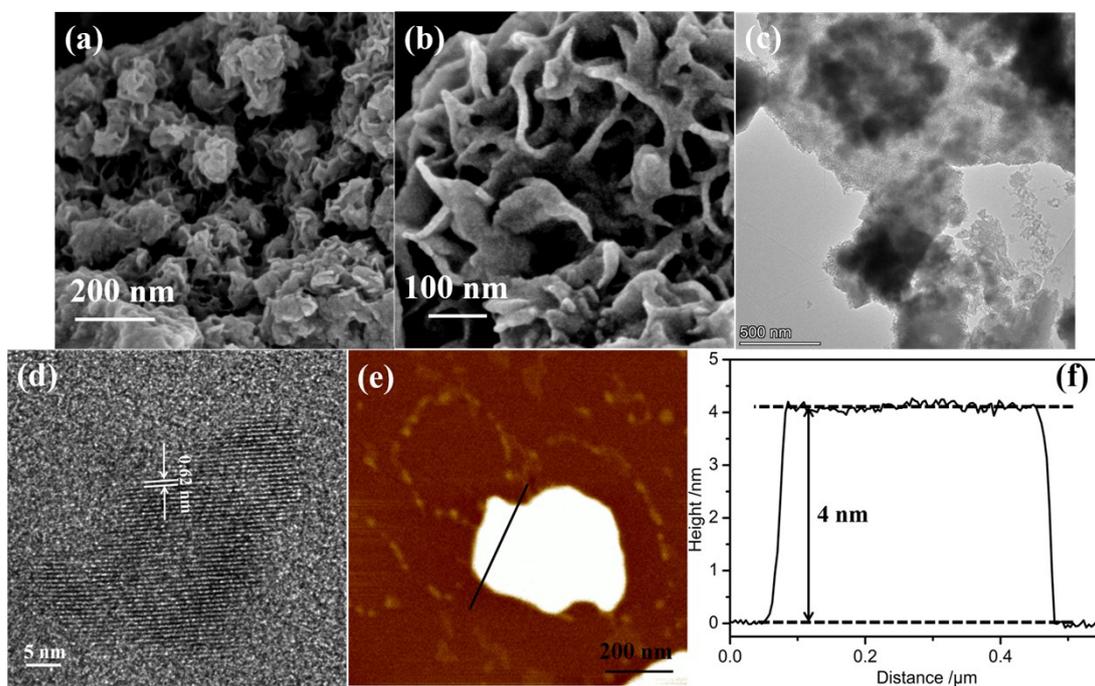# Defect-rich ultrathin MoS$_2$/rGO nanosheets electrocatalyst for oxygen reduction reaction

Songlin Zhang, Yujiao Xie, Mengna Yang, Zhongying Li, Lulu Zhang, Jiahao Guo,*

Jing Tang,* Junming Chen, Xuchun Wang

College of Chemistry and Materials Engineering, Anhui Science and Technology University,

Bengbu, Anhui, 233030, P. R. China.

Figure S1 (a) Low-magnification SEM image, (b) High-magnification SEM image, (c) TEM image, (d) HRTEM image, (e) AFM image and (f) height profiles from sections as indicated by the black line of MoS$_2$.
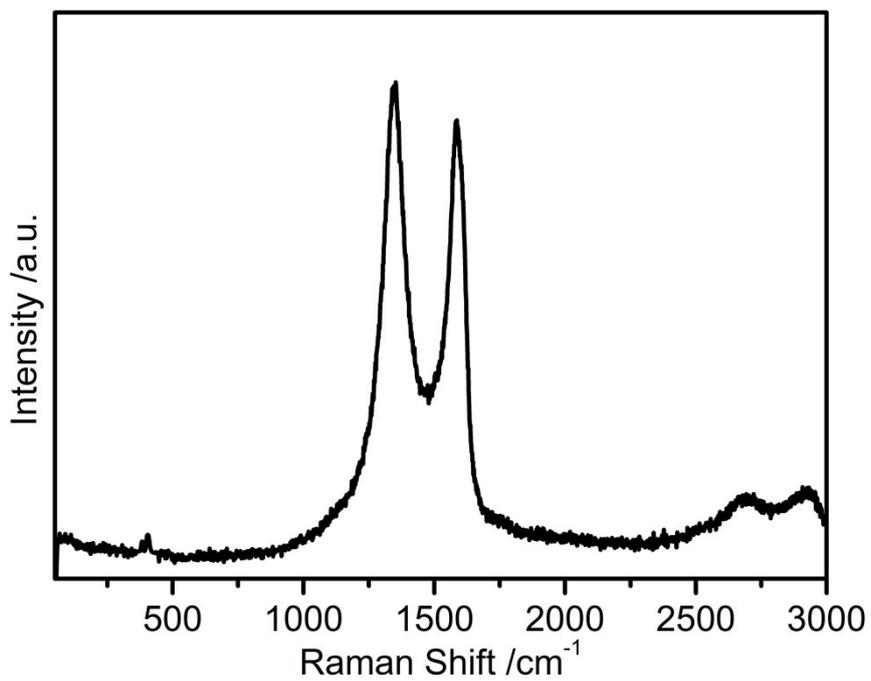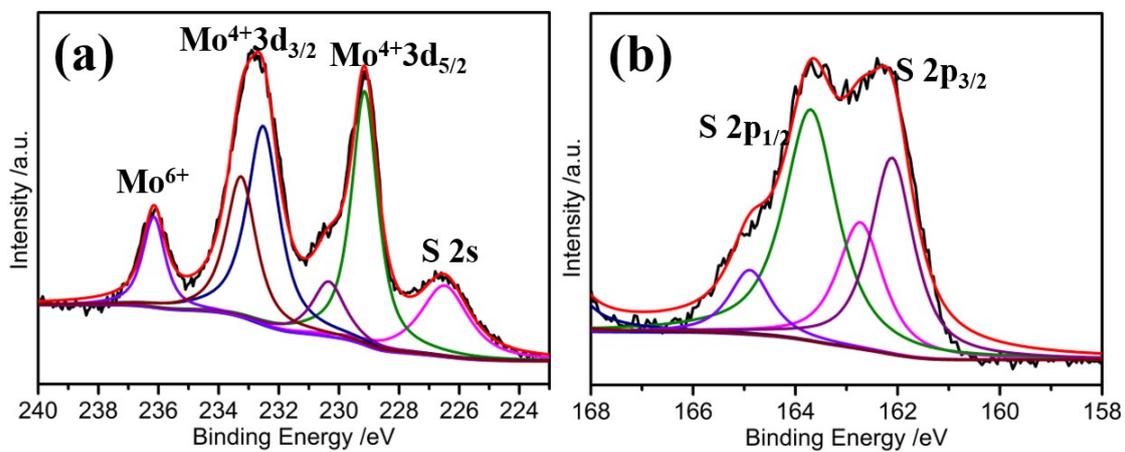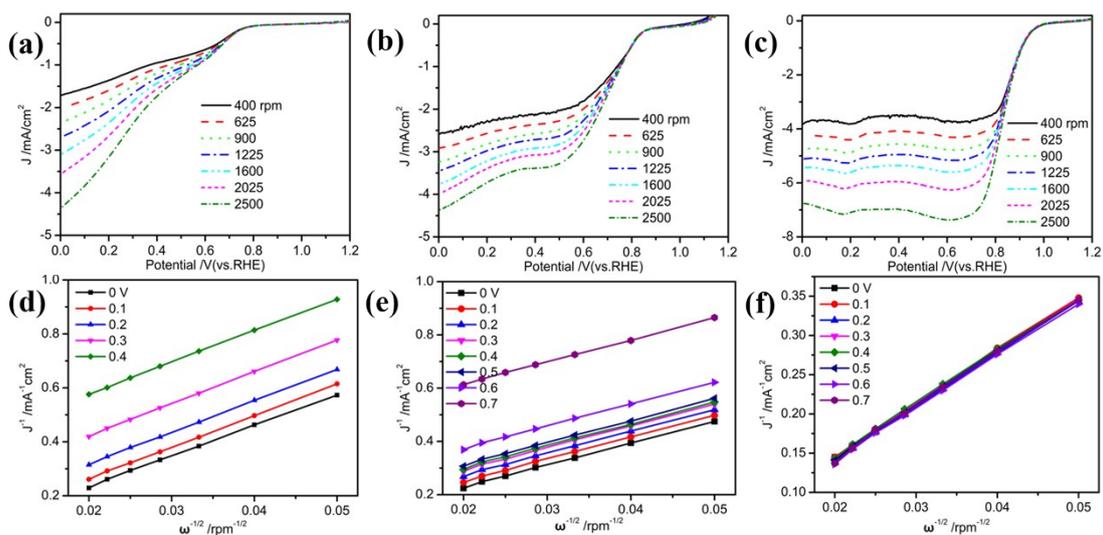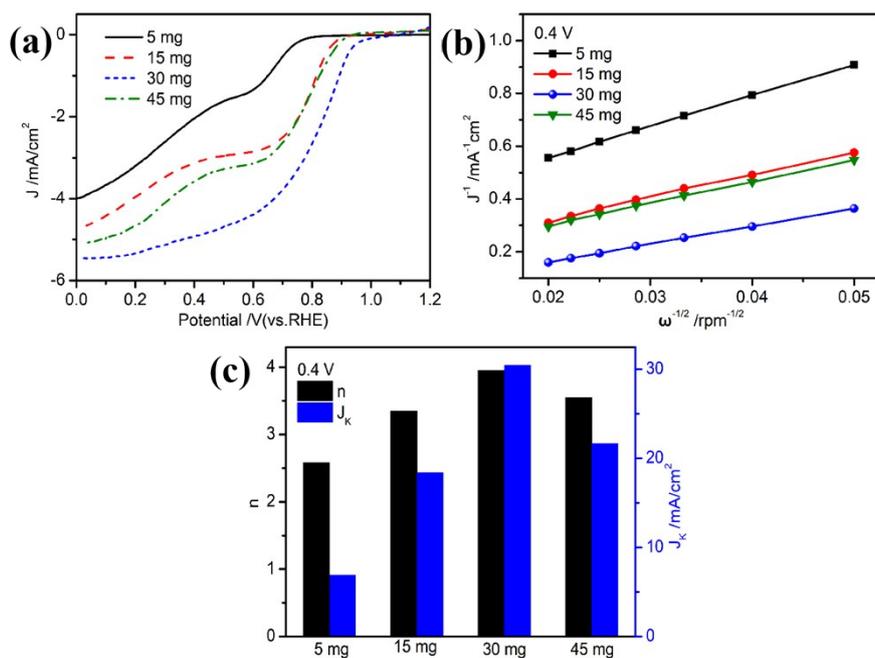
Figure S2 Raman spectrum of MoS$_2$/rGO

Figure S3 High-resolution XPS profiles of (a) Mo3d and (b) S2p of MoS$_2$.

Figure S4 (a,d) LSV and calculated K–L plots of MoS_2, (b,e) LSV and calculated K–L plots of rGO, (c,f) LSV and calculated K–L plots of Pt/C.

Figure S5 (a) Linear sweep voltammetry (LSV) of MoS_2/rGO samples with different graphene content in O_2-saturated 0.1 M KOH at a scan rate of 10 mV·s^{-1} with an RDE rotation rate of 1600 rpm. (b) K–L plots at 0.4 V of MoS_2/rGO samples with different graphene content. (c) transferred electron number n and J_K of the ORR for MoS_2/rGO samples with different graphene content.
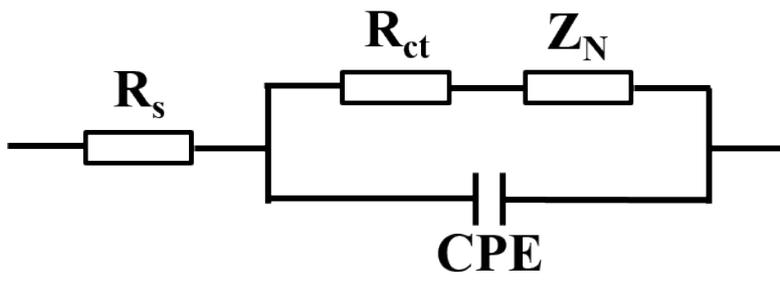
Figure S6 The equivalent circuit model of EIS.