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

Support Information

Freeze-dried WS_2 Composite with Low Content of Graphene as High-Rate Lithium Storage Material

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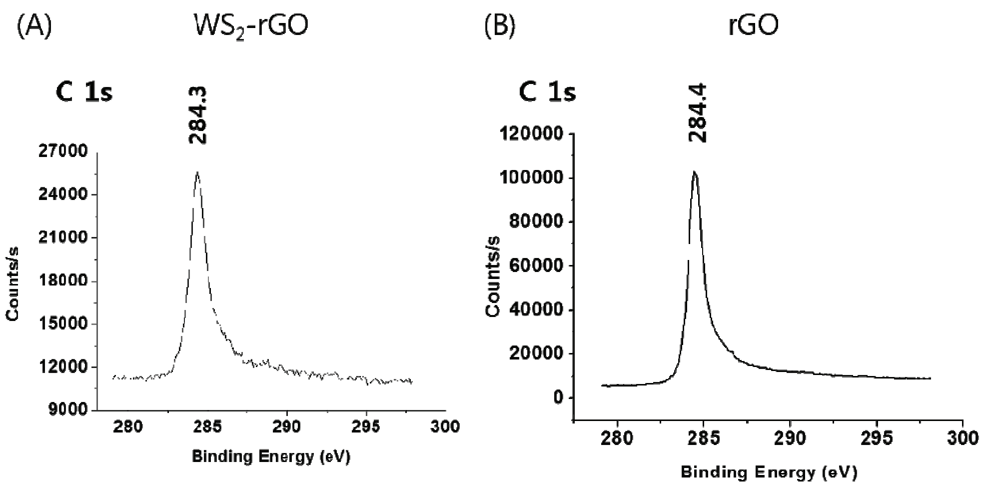

Fig. S1 XPS C 1s binding energy region of (A) WS_2-rGO nanosheets composite and (B) chemically reduced rGO.

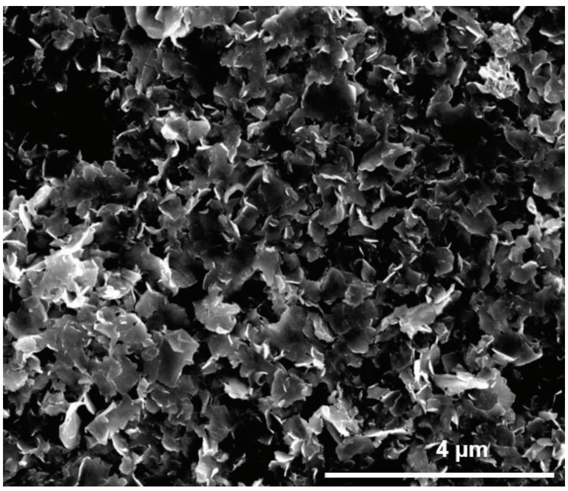

Fig. S2 SEM image of as-prepared few-layered WS_2 nanosheets.

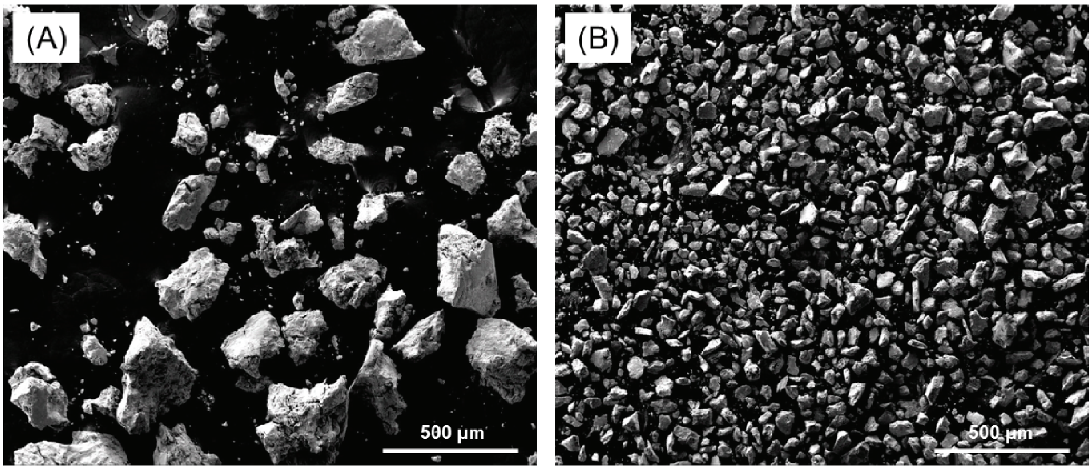

Fig. S3 (A) SEM image of as-prepared vacuum-dried WS_2-rGO (B) SEM image of vacuum-dried WS_2-rGO after grinding.

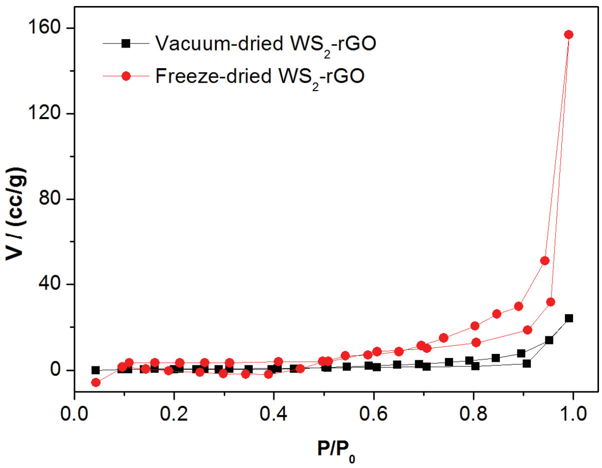

Fig. S4 Comparative N_2 adsorption-desorption isotherms of freeze-dried WS_2-rGO and vacuum-dried WS_2-rGO. BET areas of freeze-dried and vacuum-dried WS_2-rGO were calculated to be 9.5 and 1.8 m^2/g, respectively.

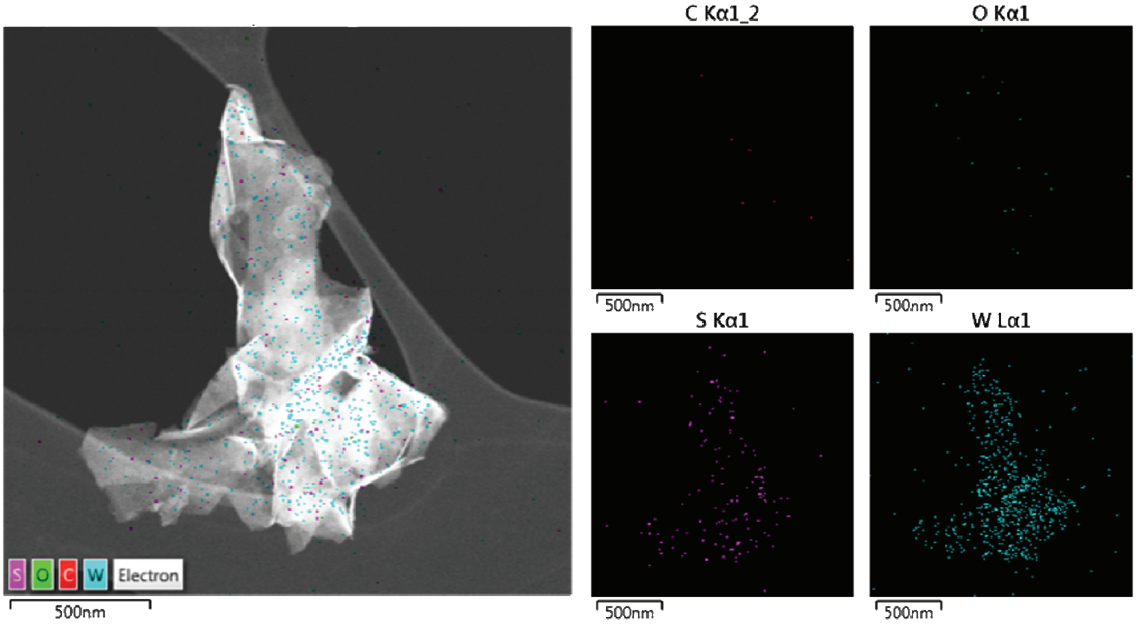

Fig. S5 EDXS mapping images of freeze-dried WS_2-rGO nanosheets.

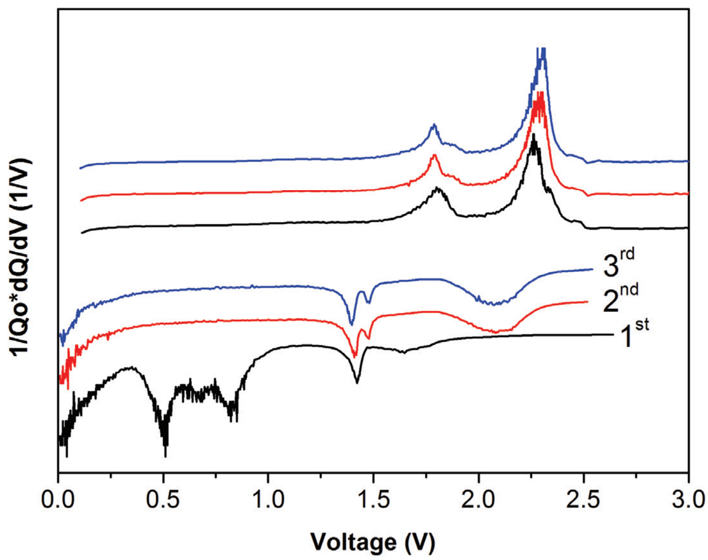

Fig. S6 Differential capacity curves of freeze-dried WS_2-rGO at a current density of 35 mA g^{-1} in coin-type lithium cell (2016R).

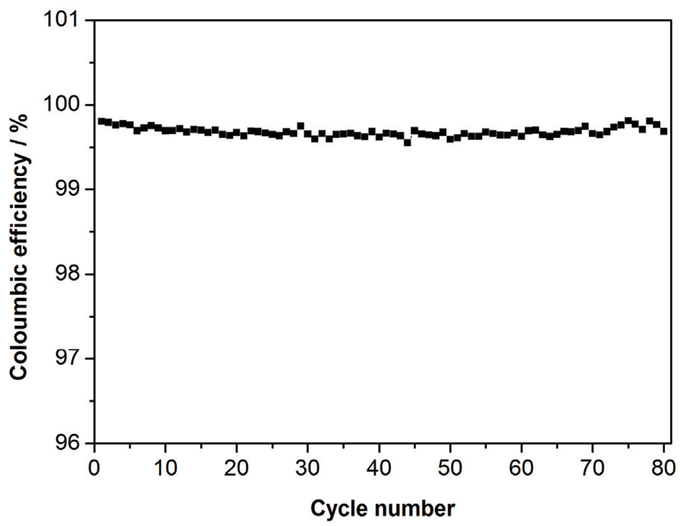

Fig. S7 Coloumbic efficiency of freeze-dried WS_2-rGO composite cycled at a current density of 0.35 A g^{-1}.

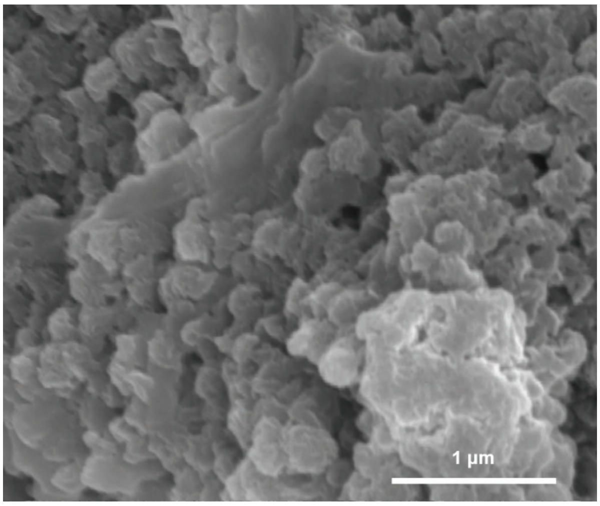

Fig. S8 SEM image of WS_2-rGO composite after 80 cycles at a current density of 0.35 A g^{-1}.

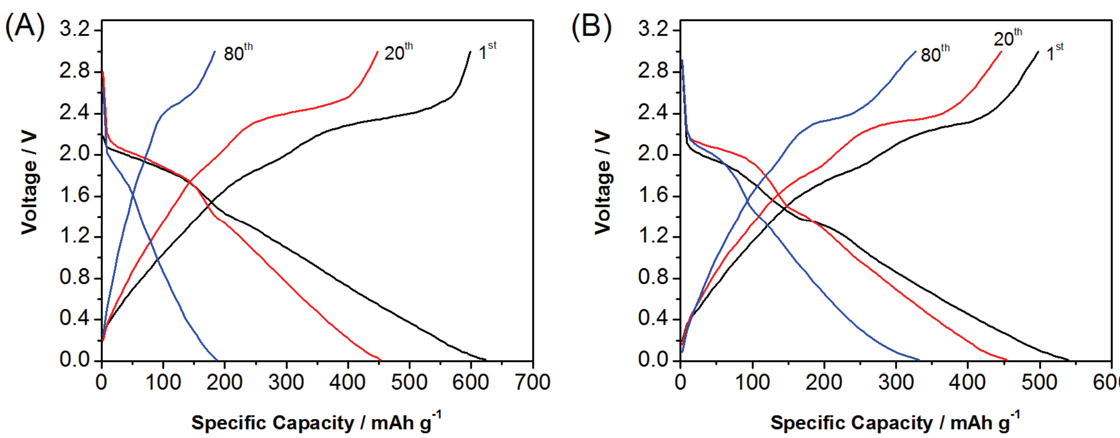

Fig. S9 Discharge-charge voltage profiles of (A) vacuum-dried WS_2-rGO composite (B) bare WS_2 during cycling at a current density of 0.35 A g^{-1} in coin-type lithium cell (2016R) at 23 °C.

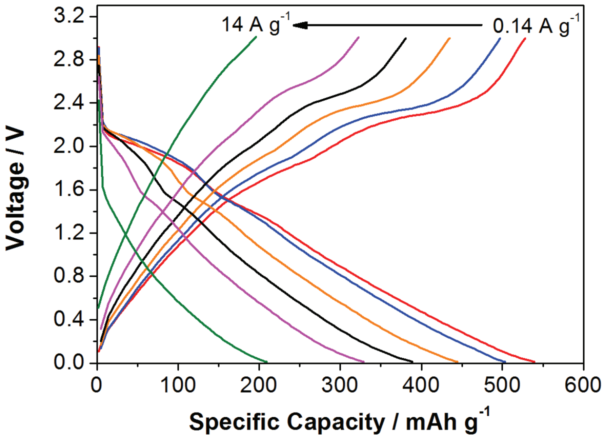

Fig. S10 Discharge-charge voltage profiles of bare WS_2 at different current densities from 0.14 to 14 A g^{-1}.