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

Supporting Information

Fast Li^+ Diffusion in Interlayer-Expanded Vanadium Disulfide Nanosheets for Li^+/Mg^{2+} Hybrid-Ion Batteries

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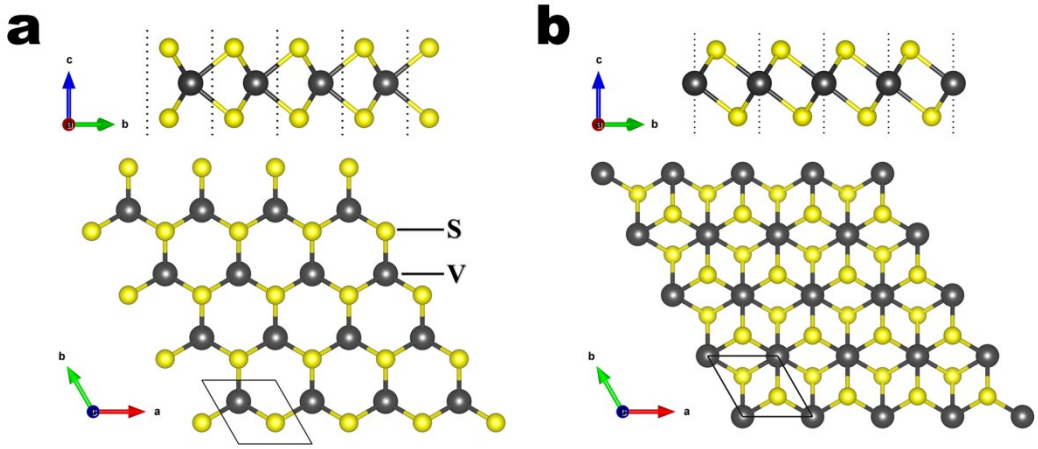

Fig. S1 Schematic of the crystal structure of (a) hexagonal VS_2, and (b) trigonal VS_2.

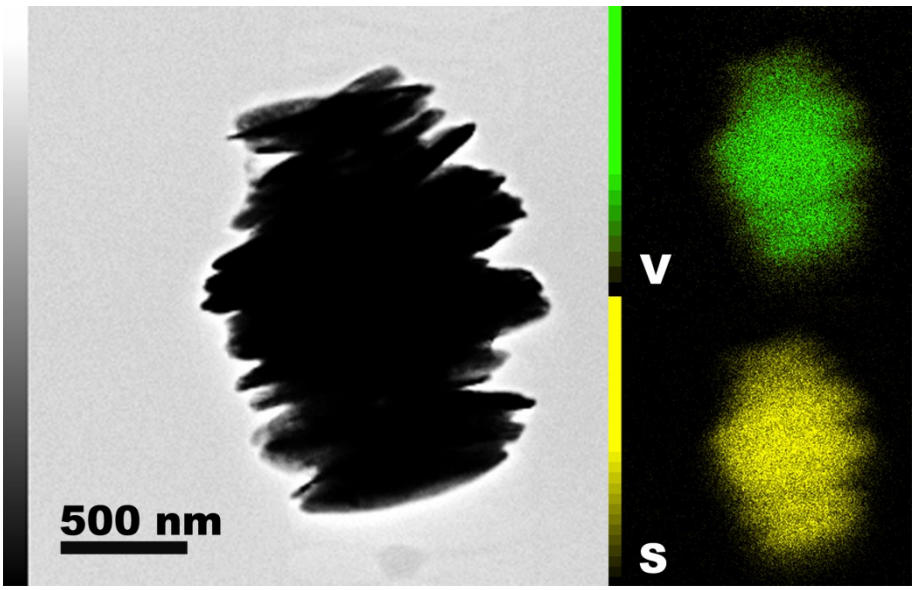

Fig. S2 V and S elemental mappings of the VS_2 nanosheets.

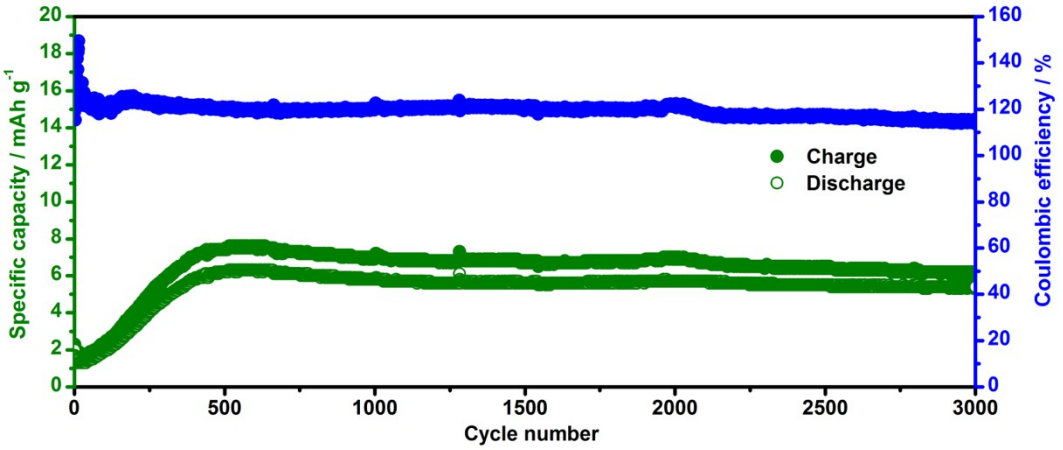

Fig. S3 Cycling performance of the VS_2 nanosheets in MRB at the current density of 50 $mA \cdot g^{-1}$.

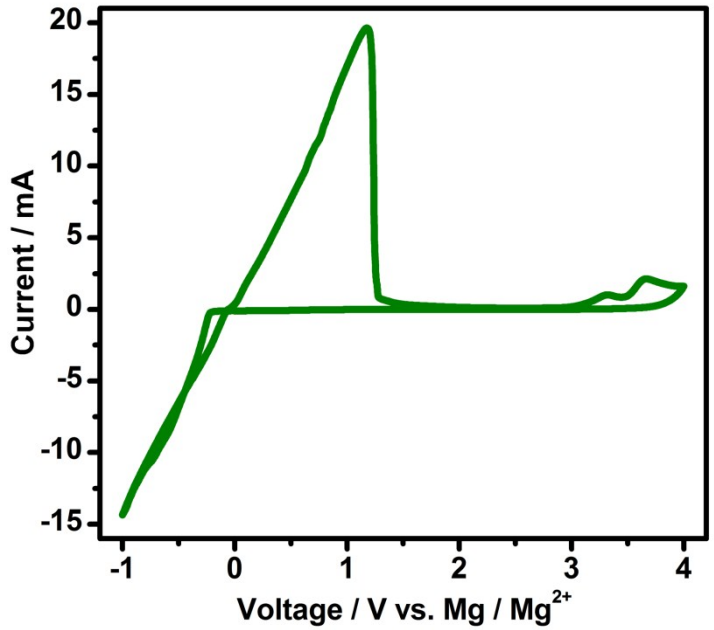

Fig. S4 CV curve of a three-electrode cell, using the APC+LiCl/THF hybrid electrolyte, stainless steel foil as the working electrode, and Mg foil as the reference and counter electrodes.

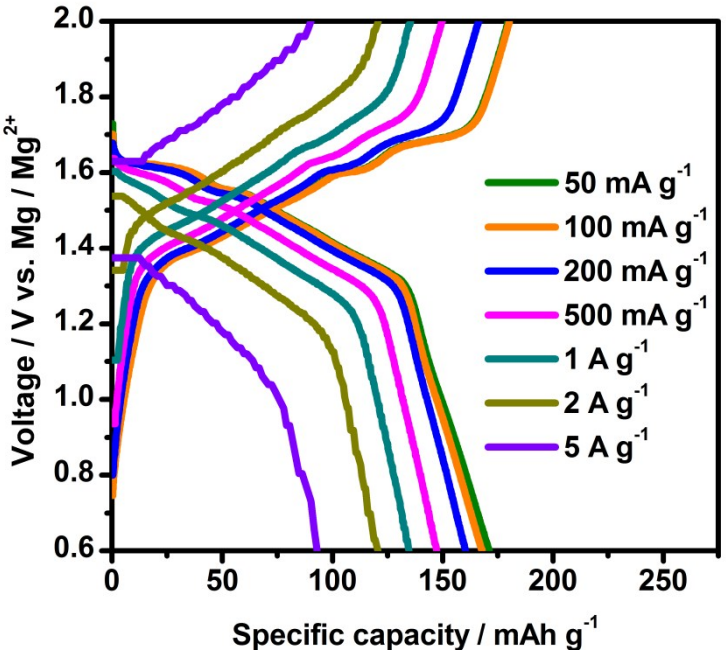

Fig. S5 Charge-discharge curves of the VS_2 nanosheets at different current densities in LMIB.

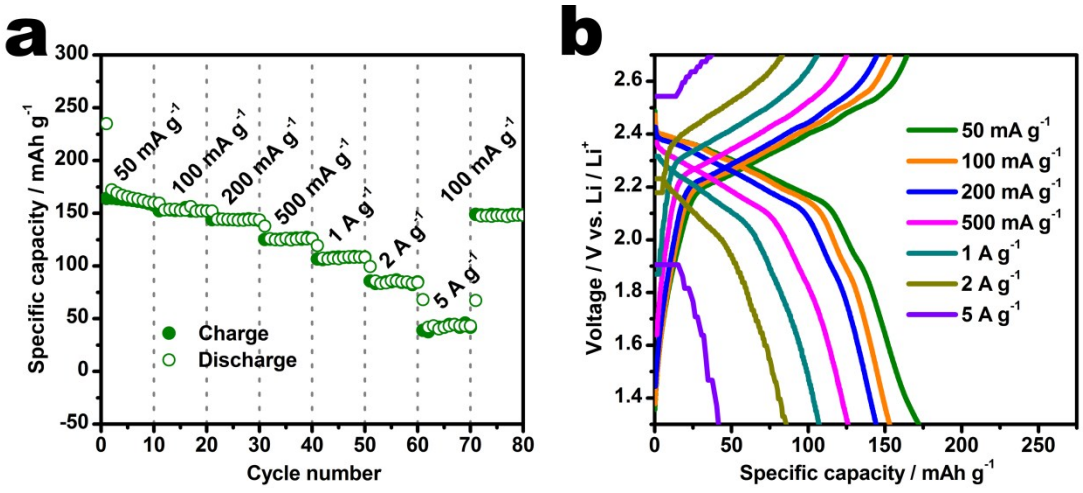

Fig. S6 (a) Rate capability and (b) charge-discharge curves at different current densities of the VS_2 nanosheets in LIB.

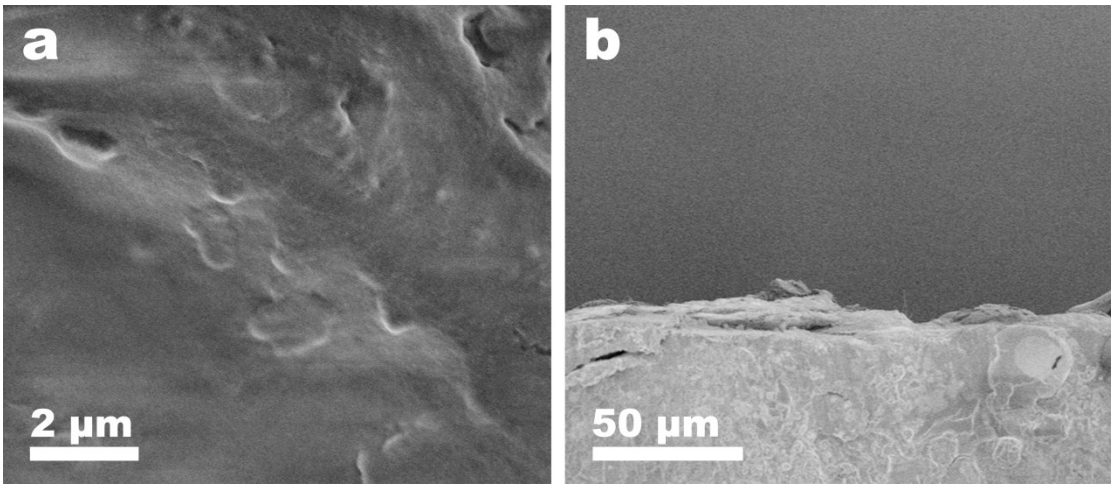

Fig. S7 (a) Surface and (b) cross section SEM images of the Mg anode after 500 cycles.

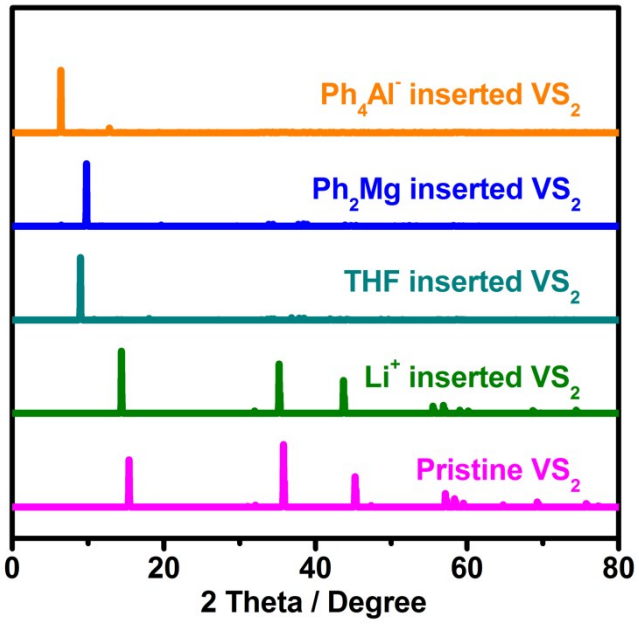

Fig. S8 Simulated XRD patterns of pristineVS_2 and Li^+, THF, Ph_2Mg and Ph_4Al^- inserted VS_2.

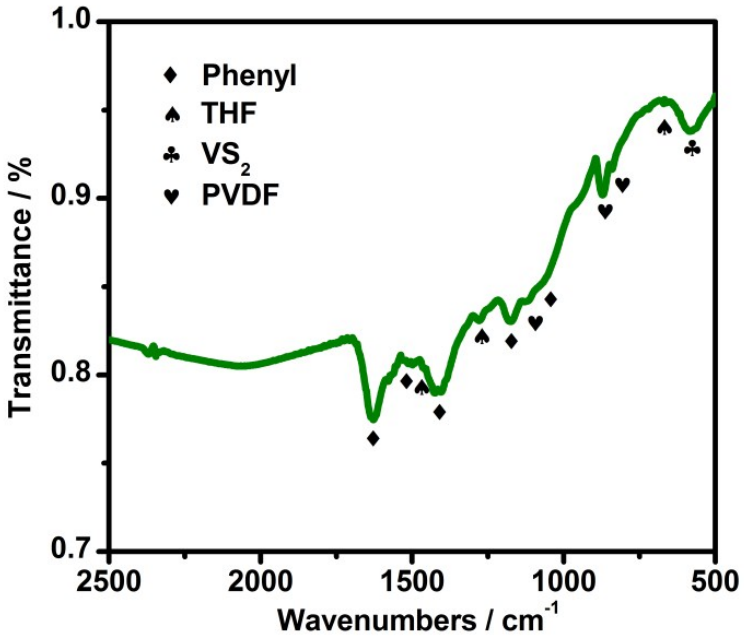

Fig. S9 FTIR pattern of the VS_2 nanosheets in LMIB collected after the first charge.

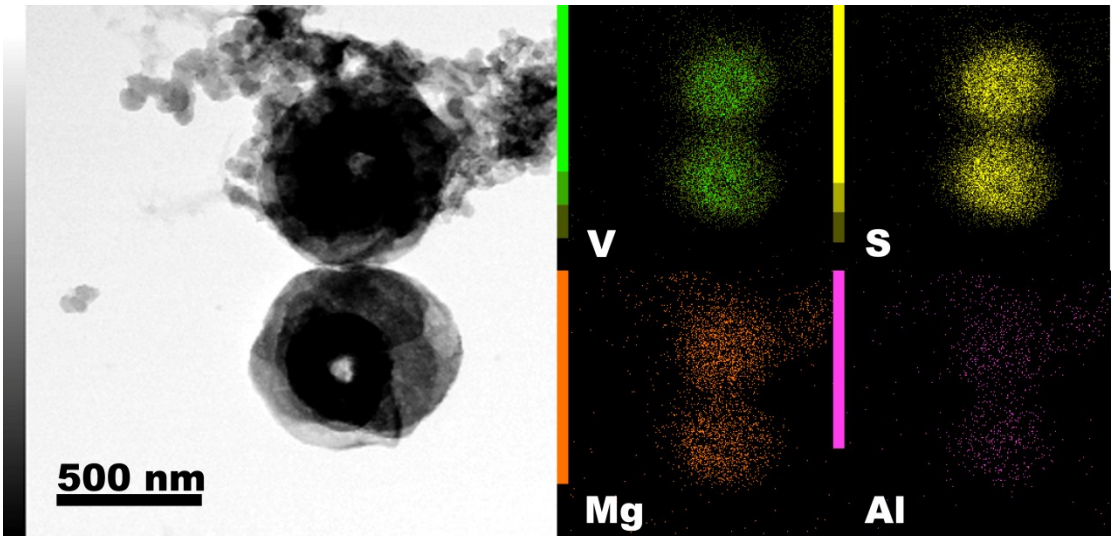

Fig. S10 V, S, Mg and Al elemental mappings of the charged VS_2 electrode in LMIB.

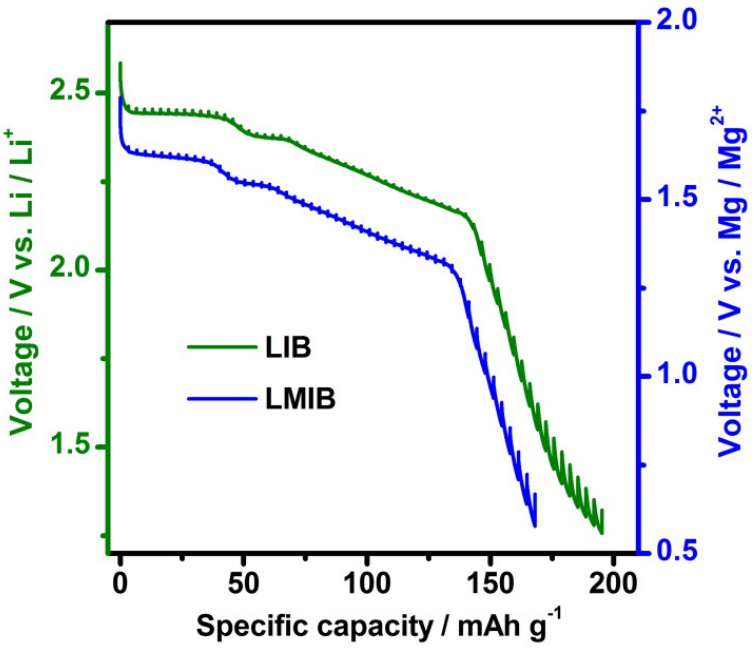

Fig. S11 GITT curves of the VS_2 nanosheets in LIB and LMIB cells during discharge process.