Electronic Supplementary Material (ESI) for RSC Advances.

Electronic Supplementary Information

Layer-Controlled Synthesis of Graphene-like MoS_2 from Single Source Organometallic Precursor for Li-ion Batteries

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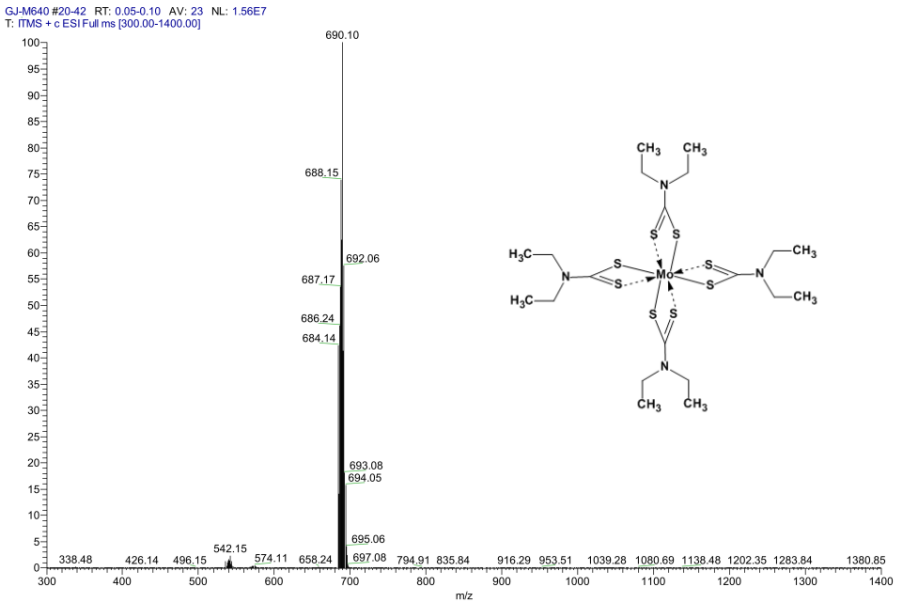

Figure S1. Mass spectrum and molecular structure of $Mo(Et_2NCS_2)_4$ precursor.

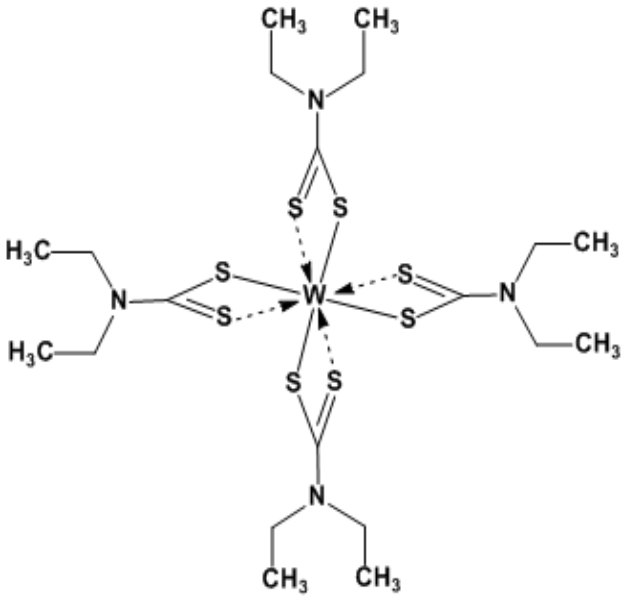

Figure S2. Molecular structure of $W(Et_2NCS_2)_4$ as single source precursor of graphene-like WS_2.

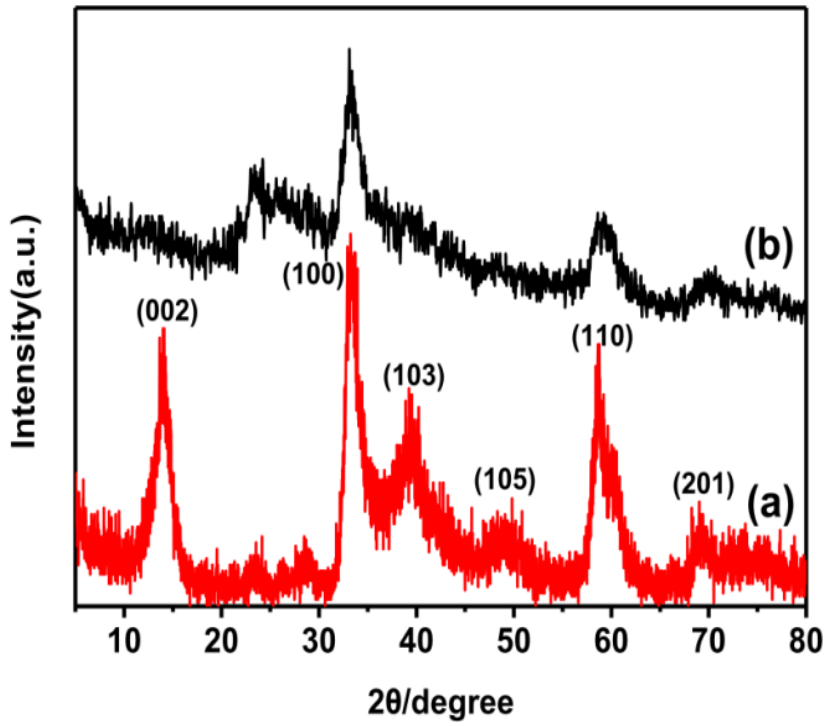

Figure S3. XRD patterns of bulk WS_2 (a) and graphene-like WS_2 (b) from the decomposition of $W(Et_2NCS_2)_4$.

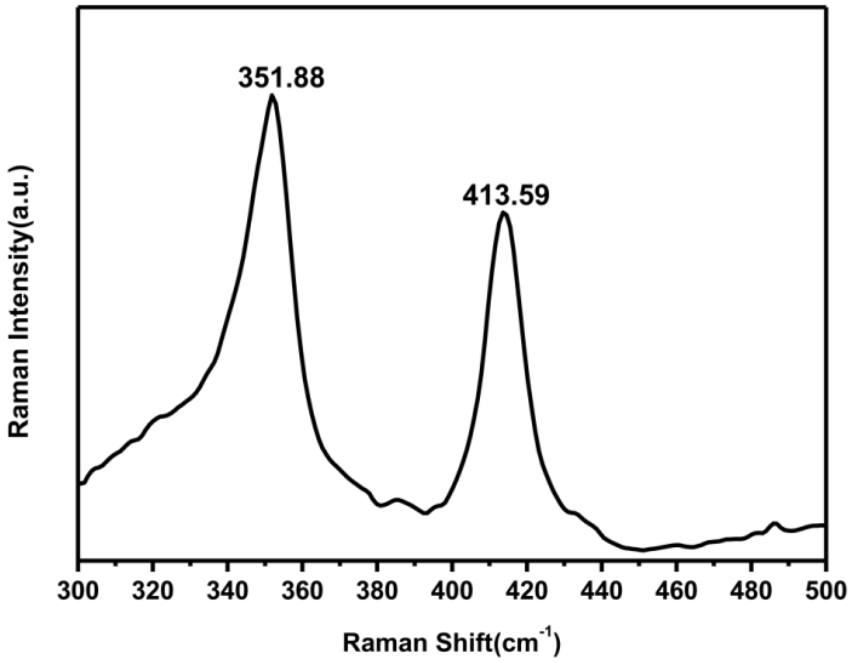

Figure S4. Raman spectrum of graphene-like WS_2 from the decomposition of $W(Et_2NCS_2)_4$.

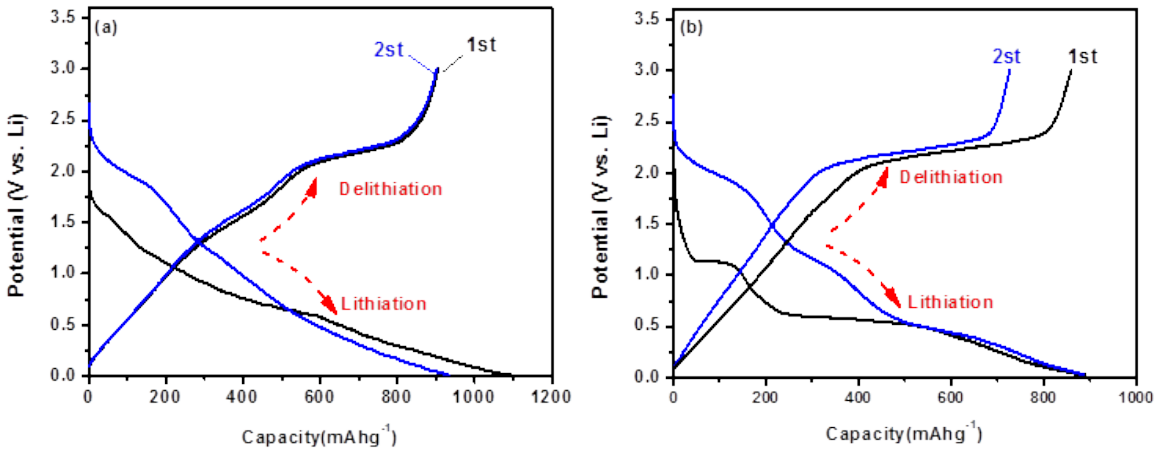

Figure S5. Electrochemical characterizations of a half-cell composed of GL-MoS_2(400 ^oC) vs. Li and B-MoS_2 vs. Li.(a) The first two charge and discharge curves of GL-MoS_2(400^oC) at a current density of 500 mA g^{-1}(b) The first two charge and discharge curves of B-MoS_2 at a current density of 500 mA g^{-1}.

Table S1. Brief Crystallographic Data and Data Collection

Formular	$C_{50}H_{104}Mo_{10}N_8O_{26}S_{16}$
*M*r	2705.77
Crystal system	Monoclinic
Space group	P2(1)/c
a /Å	12.2205(8)
b /Å	30.1724(15)
c /Å	13.0655(7)
α (°)	90
β (°)	98.252(3)
γ (°)	90
V (Å^3)	4767.7(5)
Z	2
D_c (g·cm^{-3})	1.885
μ (mm^{-1})	1.684
Reflns measd	18259
Unique reflns, R_{int}	8384, 0.0375
Completeness to theta = 26.50	99.8 %
GoF on F^2	0.958
R_1, wR_2 [$I>2\sigma(I)$][a]	0.0394, 0.0968
R_1, wR_2 (all data)[a]	0.0589, 0.1066

[a] $R_1 = \Sigma (|F_0|-|F_C|) / \Sigma |F_0|$; [b] $wR_2 = [\Sigma w (|F_0|-|F_C|)^2 / \Sigma w F_0^2]^{1/2}$.