

Electronic Supplementary Information (ESI)

Growth of two-dimensional rhenium disulfide (ReS₂) nanosheets with a few layers at low temperature

Saeah Kim^{a,e}, Hak Ki Yu^{b,e}, Seokhyun Yoon^c, Nam-Suk Lee^{d*}, and Myung Hwa Kim^{a*}

^a*Department of Chemistry & Nano Science, Ewha Womans University, Seoul, 120-750, Korea*

^b*Department of Materials Science and Engineering and Department of Energy Systems Research, Ajou University, Suwon, 443-749, Korea*

^c*Department of Physics, Ewha Womans University, Seoul, 120-750, Korea*

^d*National Institute for Nanomaterials Technology (NINT), Pohang University of Science and Technology (POSTECH), Pohang, 790-784, Korea*

^eAuthors contributed equally to this work.

*To whom all correspondence should be addressed: myungkim@ewha.ac.kr,

nslee@postech.ac.kr

Fig. S1

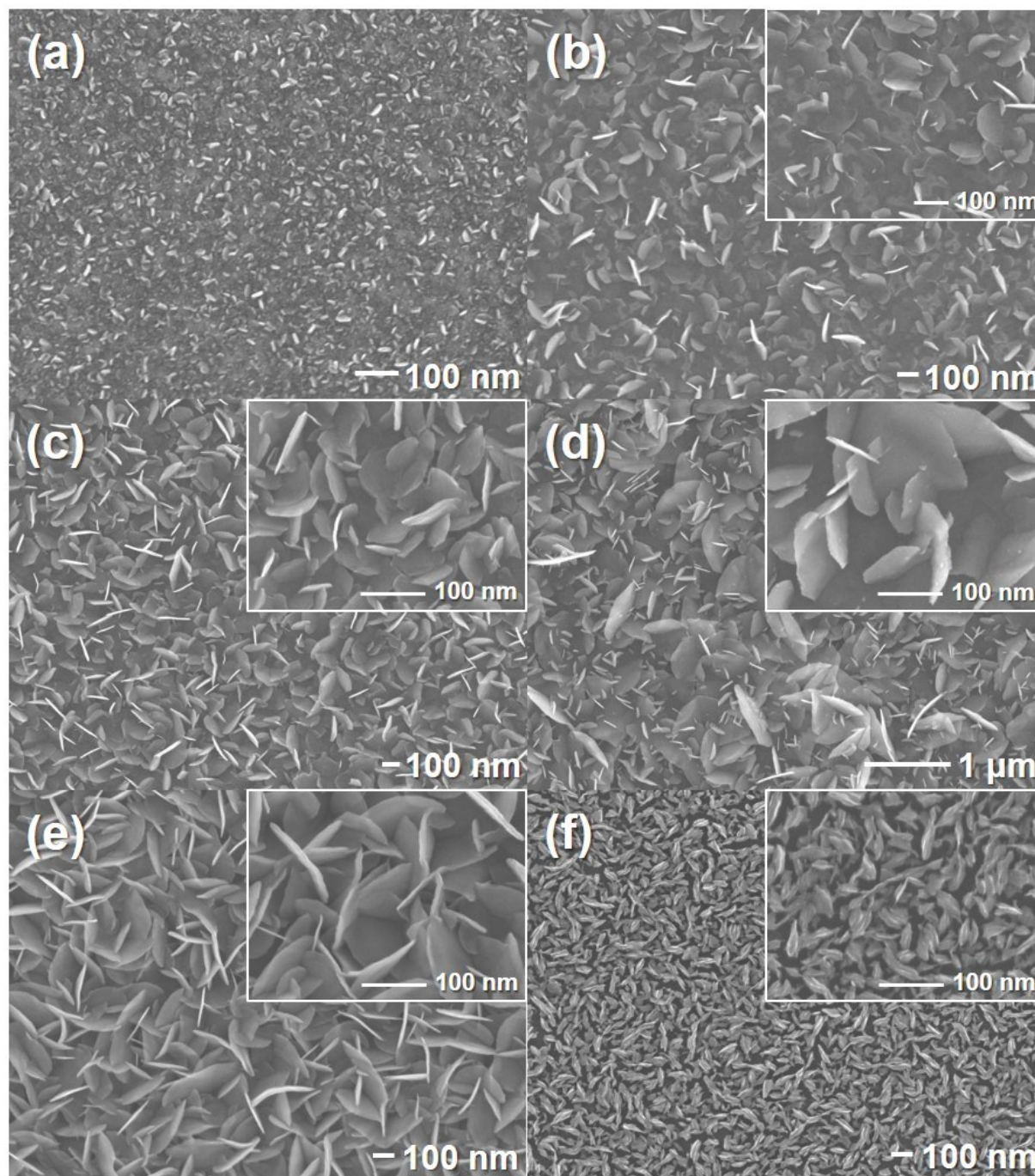
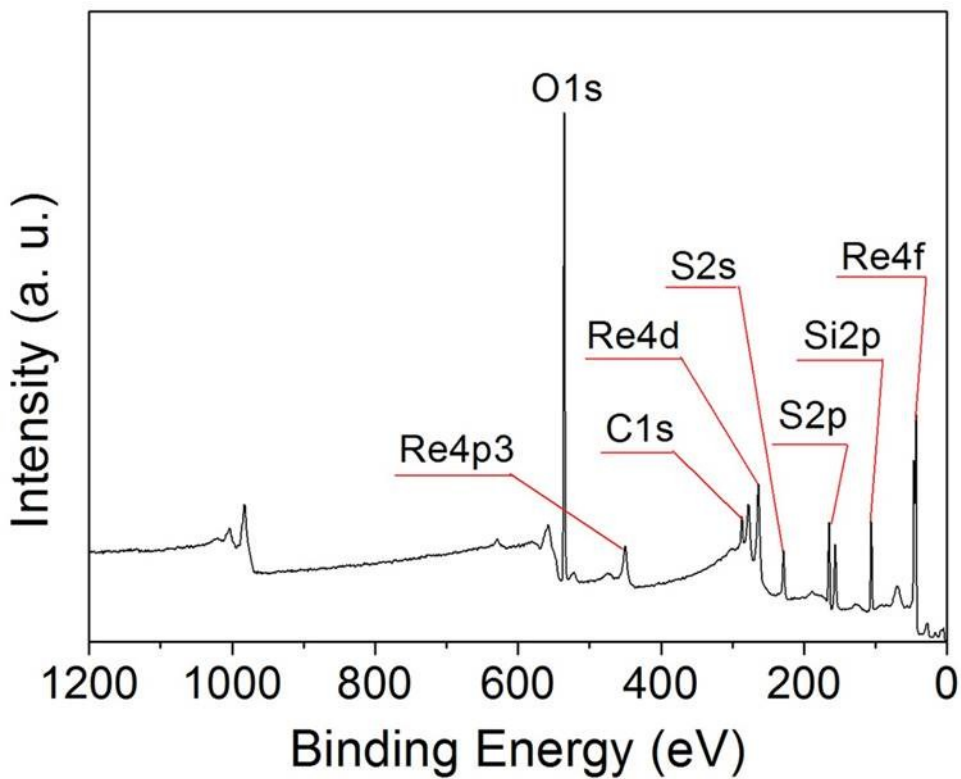


Fig. S1 The temperature dependence of the growth for the ReS₂ nanosheets under the flow of He carrier gas of 10 sccm for 20 minutes: (a) 350°C, (b) 400°C, (c) 450°C, (d) 500°C, (e) 550°C, and (f) 600°C, respectively.

Fig. S2



Name	Start BE (eV)	Peak BE (eV)	End BE (eV)	Height (CPS)	FWHM (eV)	Area (CPS.eV)	Atomic (%)
O1s	538.99	533.32	528.38	66091.59	1.51	111126.49	32.74
S2p	167.58	163.19	159.38	10169.59	1.94	20161.07	9.50
C1s	292.95	284.87	281.78	3828.51	2.06	10157.84	8.20
Re4f	49.29	42.62	39.03	32546.24	1.12	69137.90	4.80

Fig. S2 X-ray photoelectron survey spectrum for the ReS₂ nanosheets grown at 450°C under the flow of He carrier gas of 10 sccm for 20 minutes.

Fig. S3

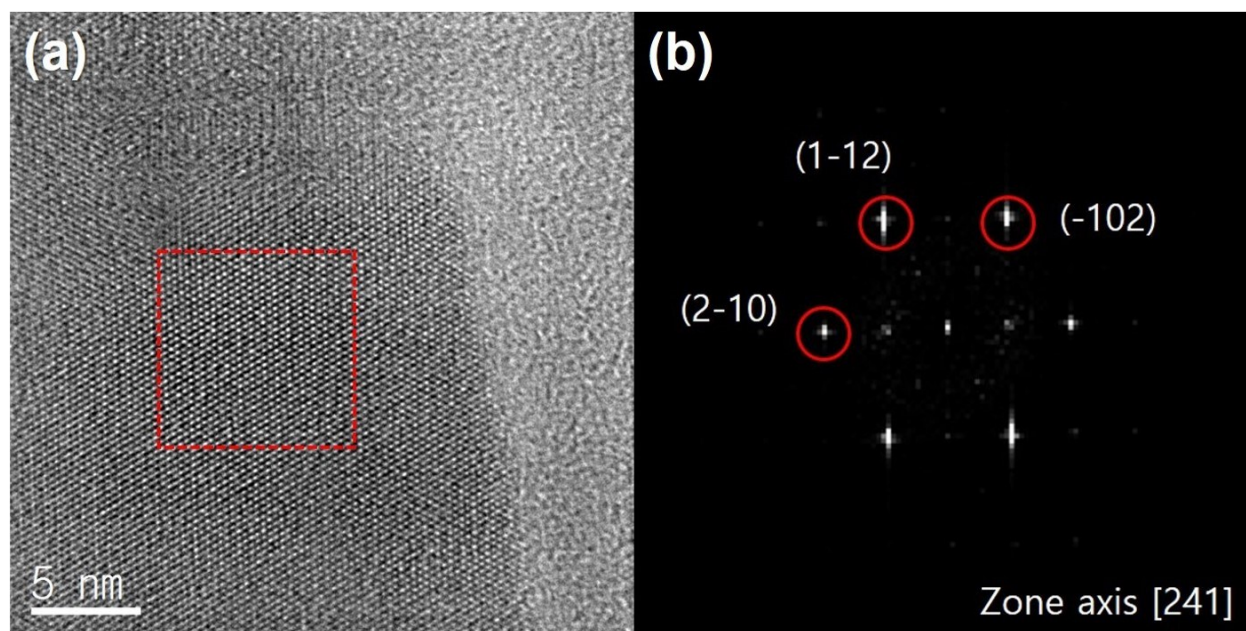


Fig. S3 Filtered Z-contrast HAADF-STEM and the corresponding FFT image of ReS₂ nanosheets taken at [241] zone axis .

Fig. S4

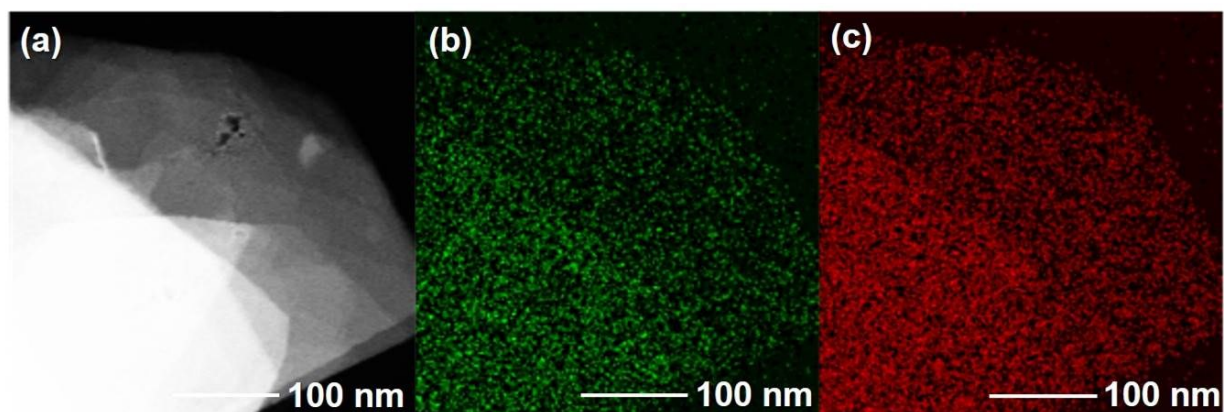
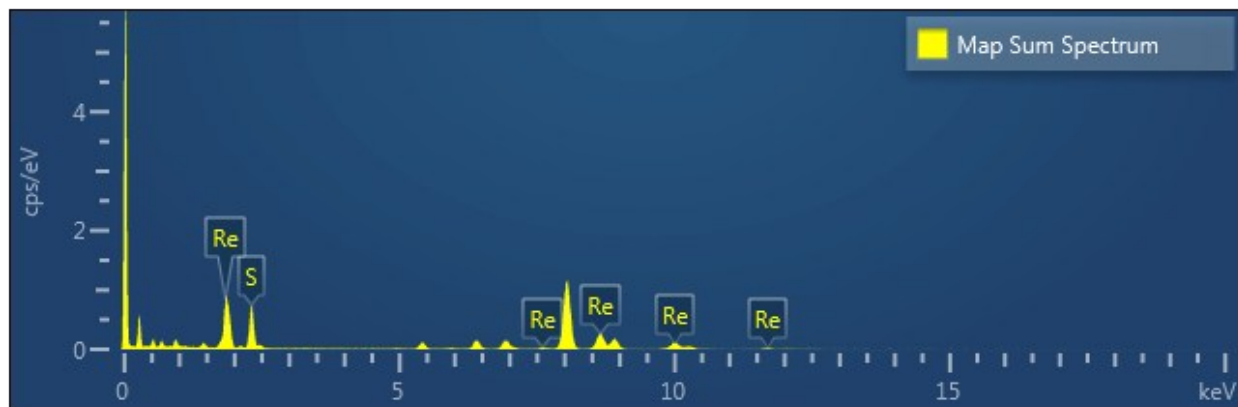


Fig. S4 Energy dispersive X-ray (EDX) elemental mapping analysis of the ReS_2 nanosheets. (a) HAADF-STEM image, (b) Re L series and (c) S K series.

Fig. S5.



Element	Line Type	k Factor	k Factor type	Absorption Correction	Wt%	Wt% Sigma	Atomic%
S	K series	0.982		1.00	27.63	0.50	68.91
Re	M series	1.665		1.00	72.37	0.50	31.09
Total					100.00		100.00

Fig. S5 TEM-EDS spectrum for the ReS₂ nanosheets grown at 450°C under the flow of He carrier gas of 10 sccm for 20 minutes.