Electronic Supplementary Information for

Anomalous Nanoinclusion Effects of 2D MoS_2 and WS_2 Nanosheets on Mechanical Properties of Polymer Nanocomposites

Sung–Kon Kim,‡[a] Jeong Jae Wie,‡[b] Qasim Mahmood[a] and Ho Seok Park*[a]

[a] Department of Chemical Engineering, College of Engineering, Kyung Hee University, 1 Seocheon-dong, Giheung-gu, Yongin-si, Gyeonggi-do 446-701, Republic of Korea
E-mail: phs0727@khu.ac.kr
[b] Azimuth Corporation, 4134 Linden Ave. #300, Dayton, Ohio 45432, USA
‡S.-K. Kim and J. J. Wie contributed equally to this work.

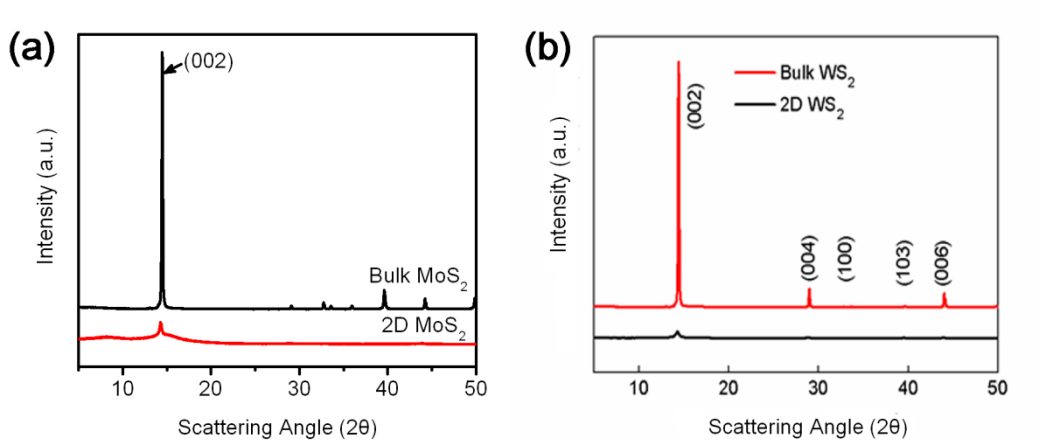

Fig. S1 E X-ray diffraction patterns of (a) bulk MoS_2 and 2D MoS_2 and (b) bulk WS_2 and 2D WS_2.

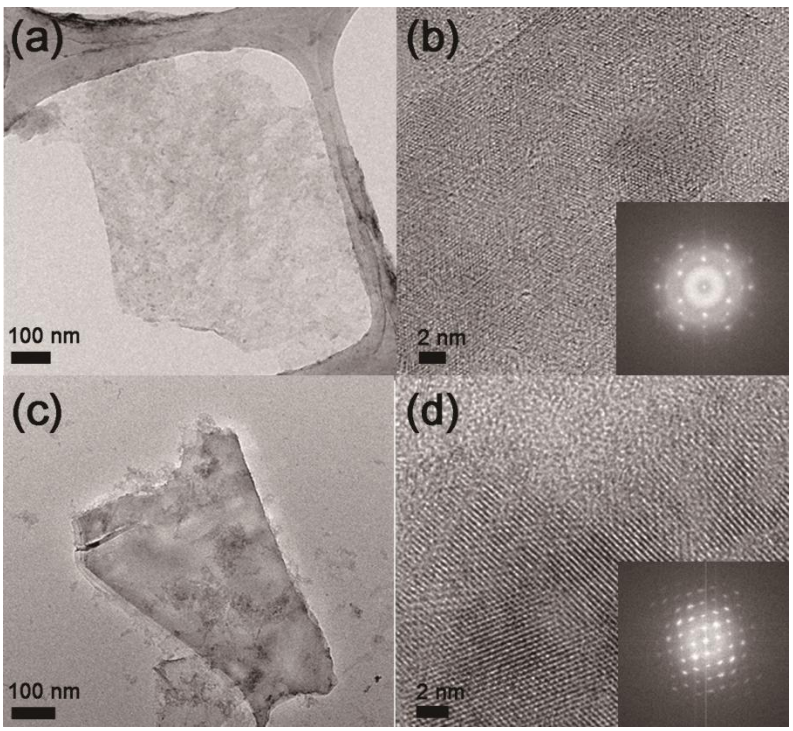

Fig. S2 TEM images of 2D (a, b) MoS_2 and (c, d) WS_2 flakes. (Inset) fast-Fourier transform (FFT) patterns.

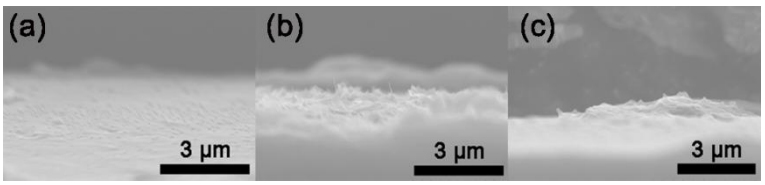

Fig. S3 SEM micrographs of fracture surface of (a) PVA, (b) PM-0.9, and (c) PW-2.0.

Table S1 Mechanical properties of PM and PW composites

	Tensile Modulus (GPa)	Ultimate Tensile Strength (MPa)	Strain-to-failure (%)
Neat PVA	1.93 ± 0.28	60.4 ± 12.4	8.2 ± 3.4
PM-0.3	2.24 ± 0.08	31.3 ± 8.2	2.0 ± 1.1
PM-0.6	2.91 ± 0.21	33.9 ± 2.7	1.4 ± 0.1
PM-0.9	3.18 ± 0.14	42.4 ± 7.2	1.6 ± 0.3
PM-1.2	2.27 ± 0.08	21.3 ± 5.4	1.0 ± 0.3
PW-0.3	2.13 ± 0.20	28.1 ± 4.4	1.7 ± 0.4
PW-0.6	2.17 ± 0.23	22.9 ± 12.6	2.2 ± 1.8
PW-0.9	2.48 ± 0.21	25.0 ± 8.8	1.1 ± 0.3
PW-1.2	2.66 ± 0.14	23.8 ± 7.6	1.0 ± 0.3
PW-1.5	2.86 ± 0.40	28.9 ± 14.1	1.2 ± 0.4
PW-2.0	2.93 ± 0.34	32.2 ± 20.6	1.4 ± 1.0
PW-2.5	1.64 ± 0.31	20.6 ± 2.6	1.6 ± 0.5