Supplementary Information
for

Water-Penetration-Assisted Mechanical Transfer of Large-Scale Molybdenum Disulfide onto Arbitrary Substrates

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The transfer process of common solution etching method was shown in Fig. S1. After transfer, PMMA polymer residue was observed in Fig. S2a and S2c as polymer carrier film cannot be completely removed. In Fig. S2b, wrinkles and microcosmic cracks were observed in SEM images, which is due to the locally generated strain. PMMA cannot afford robust mechanical support for MoS$_2$, thus it is inevitable to introduce strain into MoS$_2$ layer during this PMMA-mediated transfer process. 1 Raman peak positions in Fig. S2d were down-shifted about 1 cm$^{-1}$ compared with samples in Fig. 3 in manuscript, due to local strain and/or doping effect from PMMA residues. PL peak in Fig. S2e was also up-shifted about 10 nm.
We transferred MoS$_2$ to PET substrate, which is widely used as flexible substrate for various applications, by simply replacing SiO$_2$ target substrate with PET following the same process in Fig. 1. Fig. S3a and S3b clearly show the successful transfer of large-area MoS$_2$ film onto the PET substrate. Fig. S3c shows the perfect uniformity and cleanness of the transferred MoS$_2$ film.

References
Uk, 2015, 5.