Supporting information

Large-Area Transfer of 2D TMDCs Assisted by Water-soluble layer for Potential Device Applications

Madan Sharma1, Aditya Singh1, Pallavi Aggarwal1 and Rajendra Singh1,2,3*

1 Department of Physics, Indian Institute of Technology Delhi, Hauz Khas, New Delhi 110016, India

2 Department of Electrical Engineering, Indian Institute of Technology Delhi, Hauz Khas, New Delhi 110016, India

3 Nanoscale Research Facility, Indian Institute of Technology Delhi, Hauz Khas, New Delhi 110016, India

Corresponding author

Rajendra Singh

Email: rsingh@physics.iitd.ac.in
Figure S1. Photograph of transferred 3L MoS$_2$ lifted off in 2M NaOH solution. The optical image clearly shows that film was damaged during the transfer process.
**Figure S2.** Optical image of transferred 3L MoS$_2$ lifted off in hot DI water. Cracks and wrinkles are formed in the transferred film due to the generation of water bubbles during the heating of water $> 80^\circ$C. Also, PMMA/MoS$_2$ stack was delaminated in more than 15 minutes.

**Figure S3.** (a) Photograph of SiO$_2$/Si growth substrate (S1) from where trilayer MoS$_2$ has been transferred onto target substrate (S2). (b) and (c) are optical and AFM images of S1, respectively.
Figure S4. Raman spectra of sample S1. No $A_{1g}$ and $E^{1}_{2g}$ peaks were observed between 300 to 500 cm$^{-1}$, which confirms the complete lift-off of MoS$_2$ film from the growth substrate.