Electronic Supplementary Material (ESI) for Physical Chemistry Chemical Physics.

Electronic Supplementary Information

Strong and efficient doping of monolayer MoS_2 by graphene electrode

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Additional samples under study

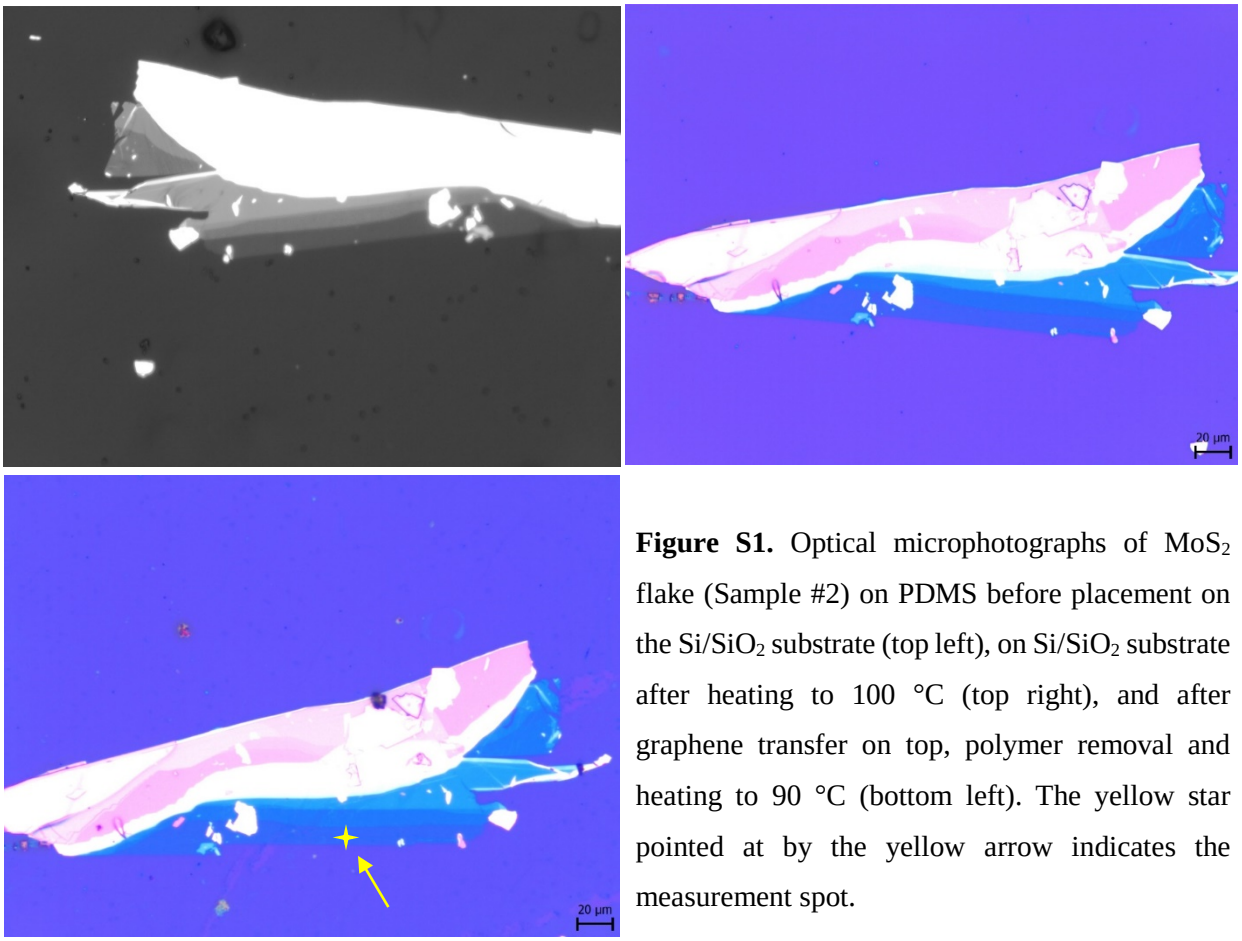

Figure S1. Optical microphotographs of MoS_2 flake (Sample #2) on PDMS before placement on the Si/SiO_2 substrate (top left), on Si/SiO_2 substrate after heating to 100 °C (top right), and after graphene transfer on top, polymer removal and heating to 90 °C (bottom left). The yellow star pointed at by the yellow arrow indicates the measurement spot.

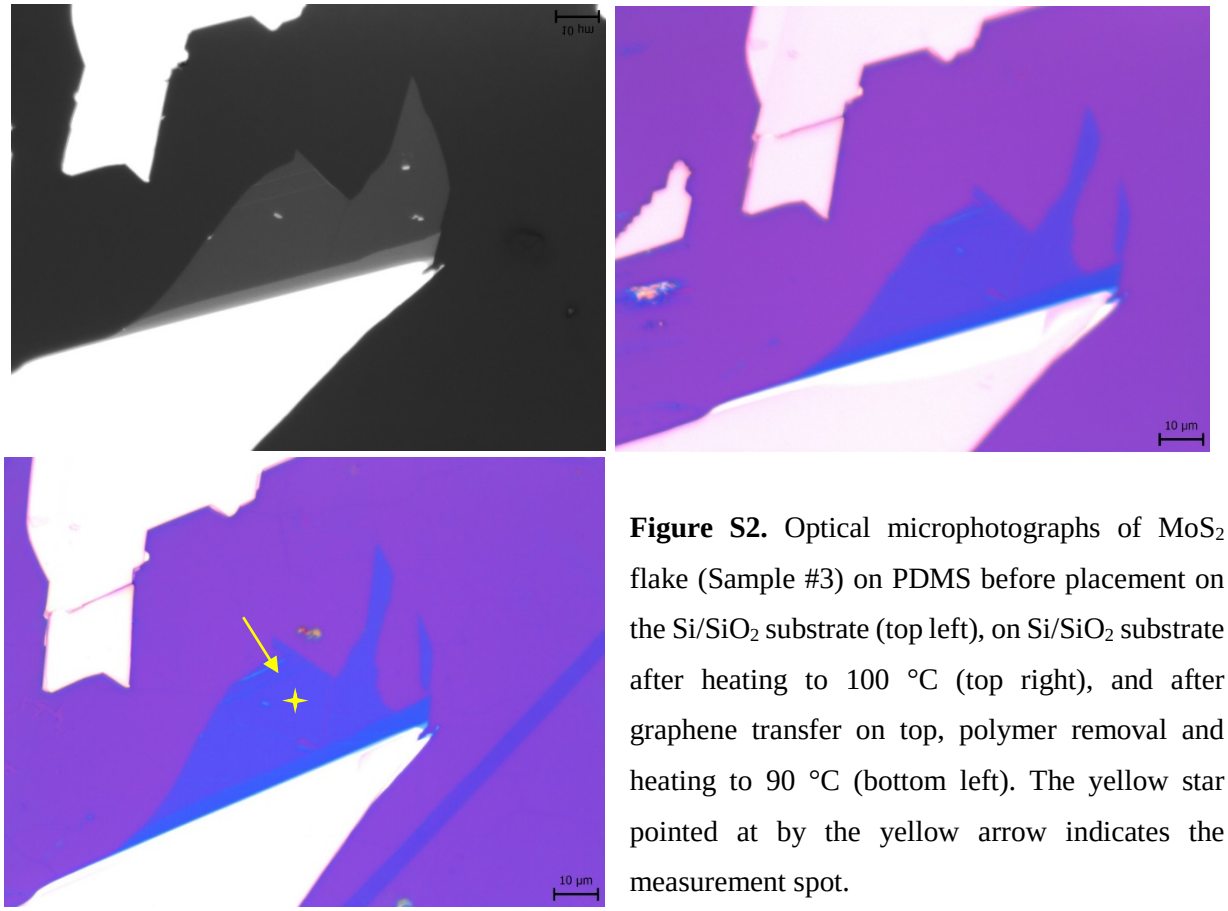

Figure S2. Optical microphotographs of MoS_2 flake (Sample #3) on PDMS before placement on the Si/SiO_2 substrate (top left), on Si/SiO_2 substrate after heating to 100 °C (top right), and after graphene transfer on top, polymer removal and heating to 90 °C (bottom left). The yellow star pointed at by the yellow arrow indicates the measurement spot.

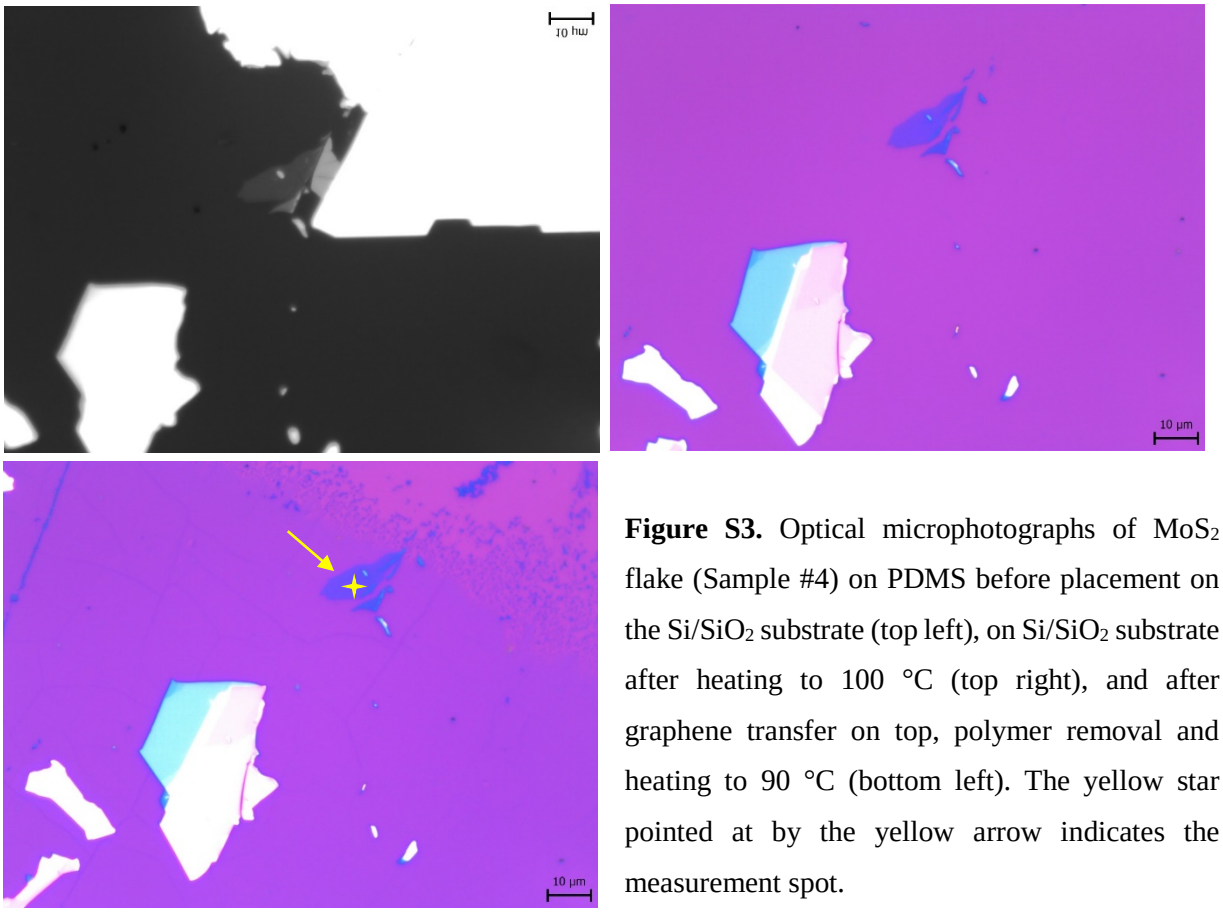

Figure S3. Optical microphotographs of MoS_2 flake (Sample #4) on PDMS before placement on the Si/SiO_2 substrate (top left), on Si/SiO_2 substrate after heating to 100 °C (top right), and after graphene transfer on top, polymer removal and heating to 90 °C (bottom left). The yellow star pointed at by the yellow arrow indicates the measurement spot.

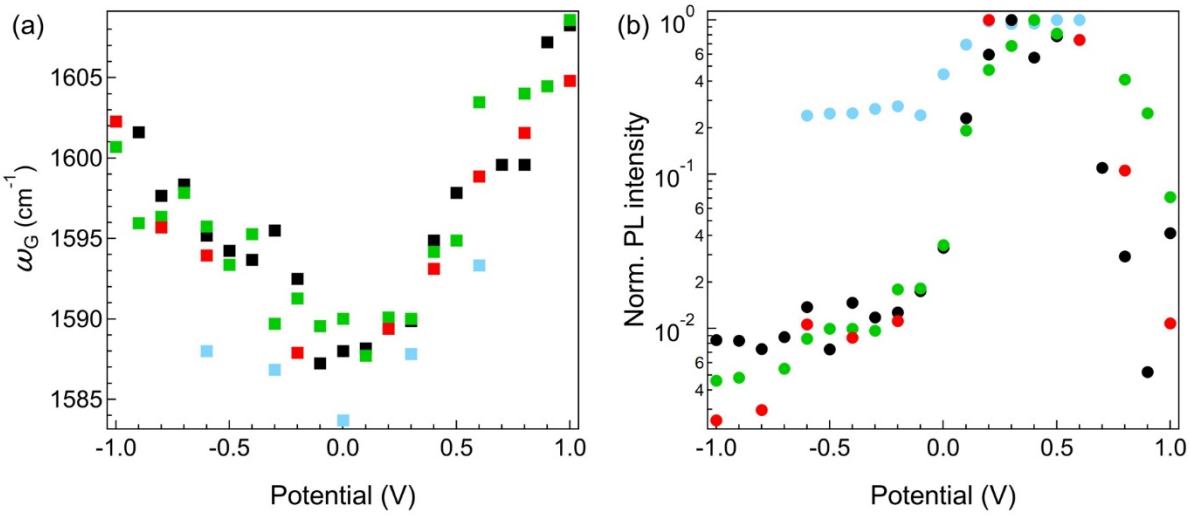

Figure S4. (a) Fitted frequency (ω_G) of the Raman G band in graphene for the 4 samples under study. (b) PL evolution of 1L MoS_2 electrochemically polarized through 1L graphene, when fitted as one peak, normalized to the maximum intensity for each experiment. Laser excitation wavelength is 488 nm.

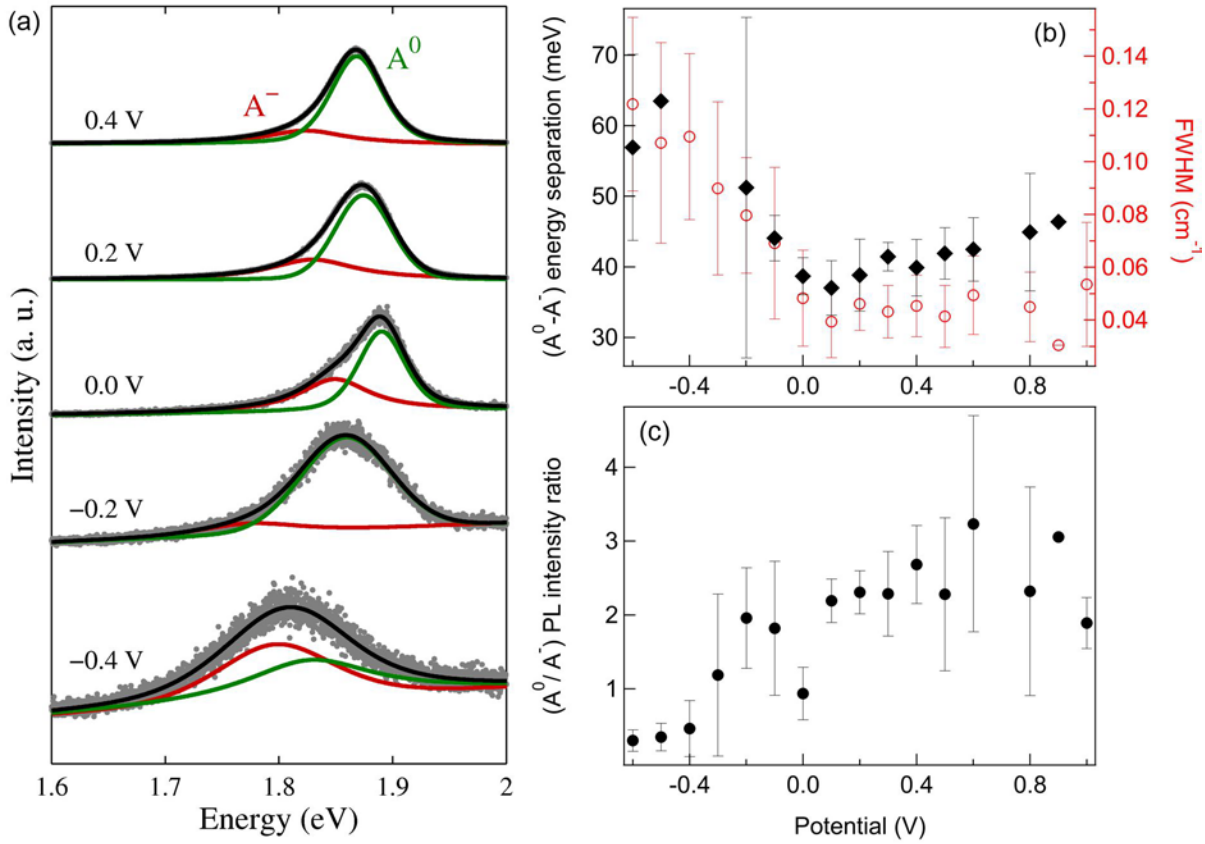

Figure S5. PL evolution of 1L MoS_2 electrochemically polarized through 1L graphene when fitted with two symmetric pseudoVoigt peaks. (a) PL spectra in the range between -0.4 to 0.4 V wih 0.2 V step. Grey points are experimental data, red and green curves the A^- and A^0 transitions, respectively, and black curve their sum. (b) (A^0-A^-) energy separation (~ trion binding energy) (black, left axis) and single peak PL FWHM for comparison, the same as in Figure 4b, main text (red, right axis). (c) (A^0 / A^-) PL intensity ratio. The error bars represent standard deviation from 3 experiments.