

Supplementary Information

Synthesis of Monolayer Graphene having Negligible Amount of Wrinkles by Stress Relaxation

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I. Overall image on boundary of Ni/rGO/Si and Ni/Si

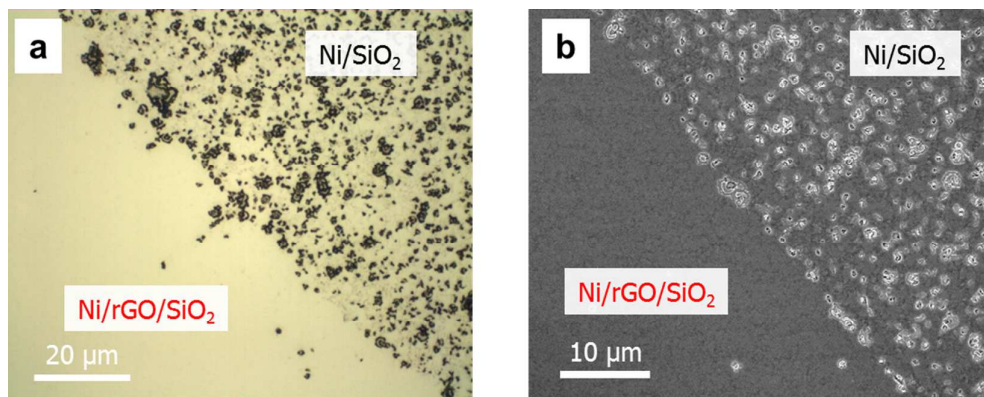


FIGURE S1. (a) Optical microscope image and (b) SEM image on the boundary of Ni/rGO/SiO₂ and Ni/SiO₂. The sample is annealed at 800°C for 10 min in (10% H₂)/Ar ambient.

II. Microscope image of transferred graphene

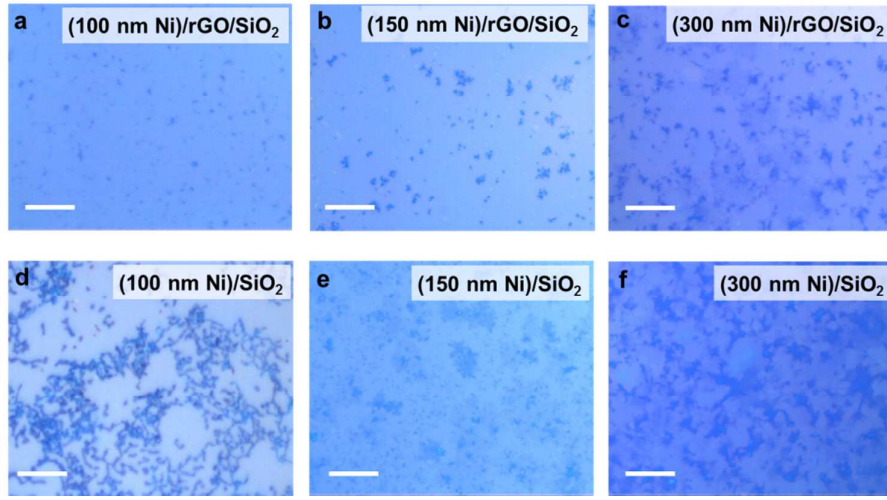


FIGURE S2. Optical microscope images of graphene layers synthesized on (a) 100 nm, (b) 150 nm, and (c) 300 nm thick Ni thin films on rGO/SiO₂, and (d) 100 nm (e) 150 nm, and (f) 300 nm thick Ni thin films on SiO₂. Each graphene layer is transferred onto a (300 nm SiO₂)/Si substrate by using a PMMA supporting layer transfer method. Scale bars = 20 μm.

III. Wrinkle and lateral layer difference of graphene grown on Ni/SiO₂.

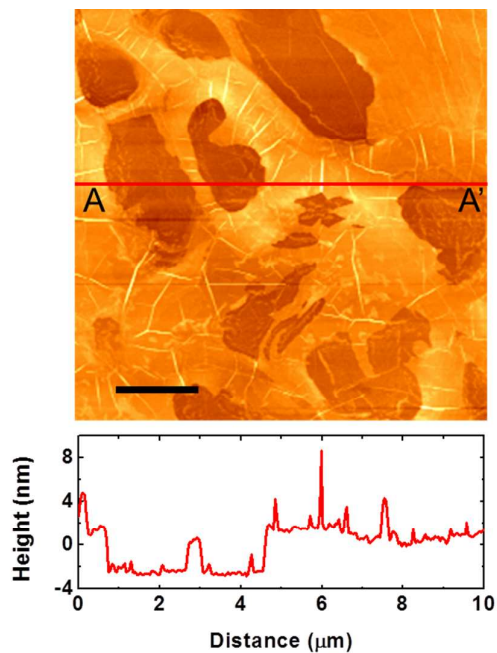


FIGURE S3. AFM image of graphene grown on 150 nm Ni / SiO₂, and its height profile along the A-A' line. The graphene layer is transferred onto a (300 nm SiO₂)/Si substrate. The graphene surface has many wrinkles and steps. Scale bar = 2 μm.

IV. Thickness and surface morphology of rGO interfacial layer

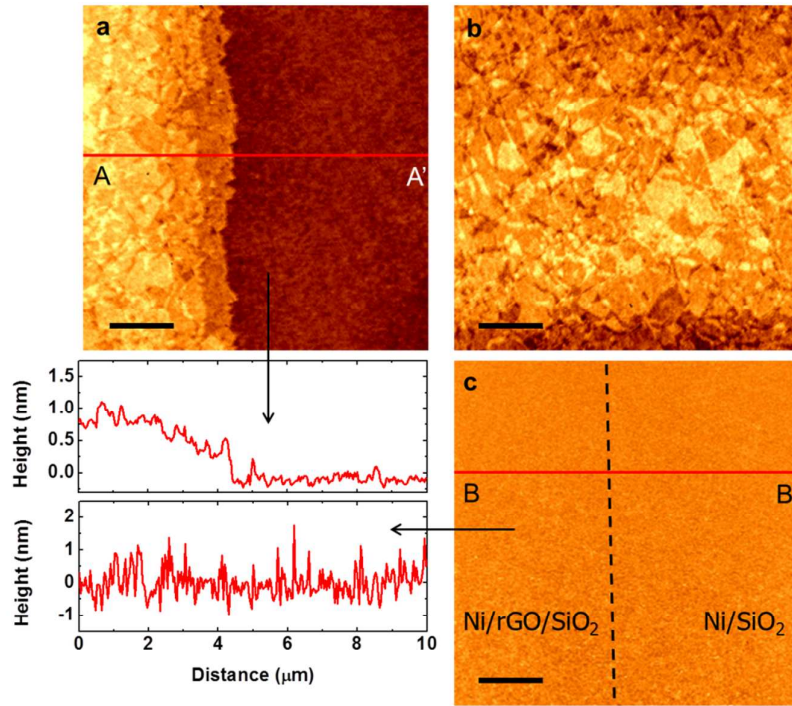


FIGURE S4. (a) AFM image near the boundary of rGO/SiO₂ and SiO₂, and its line profile along A-A'. The average thickness of rGO is ~ 1 nm. (b) AFM image of rGO/SiO₂. Multi-stacked graphene nano-flakes are observable. The RMS roughness of the rGO/SiO₂ surface is 0.21 nm. (c) AFM image of the boundary of Ni/rGO/SiO₂ and Ni/SiO₂, and its line profile along B-B'. Because the rGO layer is much thinner than the Ni film and has a smooth surface, the Ni thin film does not show any morphological difference. The RMS roughness of the Ni thin film is 0.51 nm. Scale bar = 2 μm .