Supporting Information

Fig. S1 Photo images of unexpanded (left) and expanded (right) graphite flakes on glass plate.

For the control test, the mixtures were prepared by sonication in RB solution with unexpanded and expanded graphite flakes. Both mixtures were centrifuged at 4000 rpm for 10min. The mixture with the unexpanded graphite exhibited a significant precipitation, not dispersed. On the contrary, the mixture with the expanded graphite showed well dispersed.

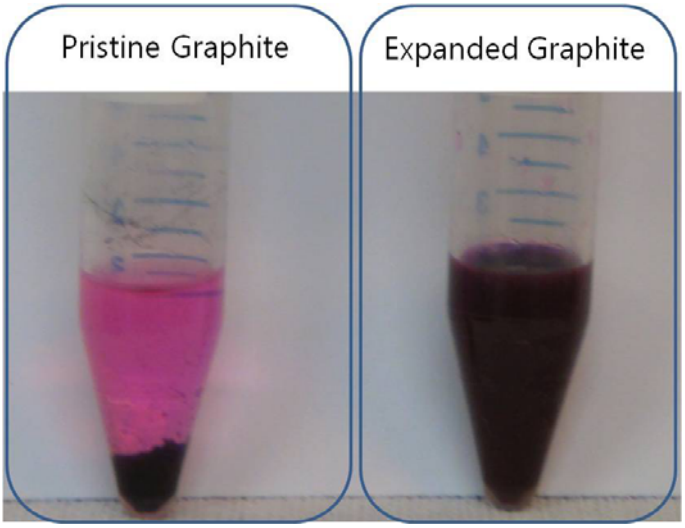

Fig. S2 Photo images for the control experiment of unexpanded (left) and expanded (right) graphite flakes. (The mixtures of unexpanded and expanded graphite with RB in DI water with a 10% DMA.)

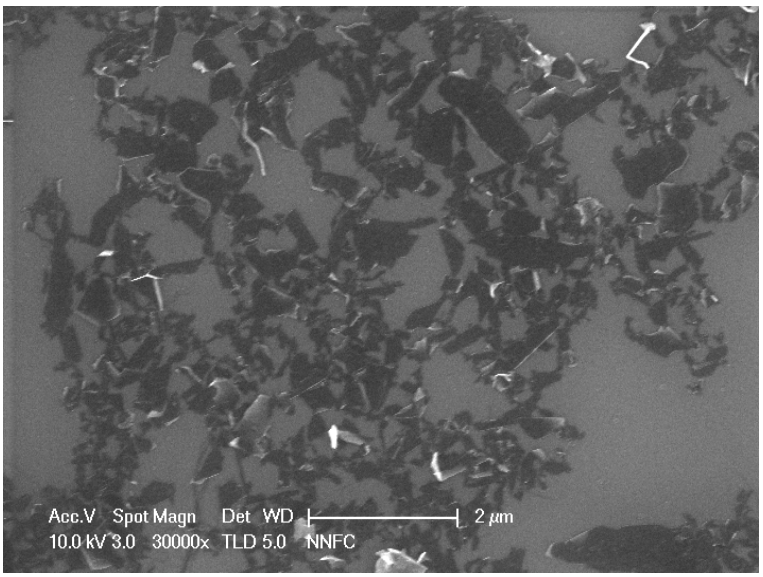

Fig. S3 SEM images of exfoliated graphene flakes on a SiO_2/Si substrate.

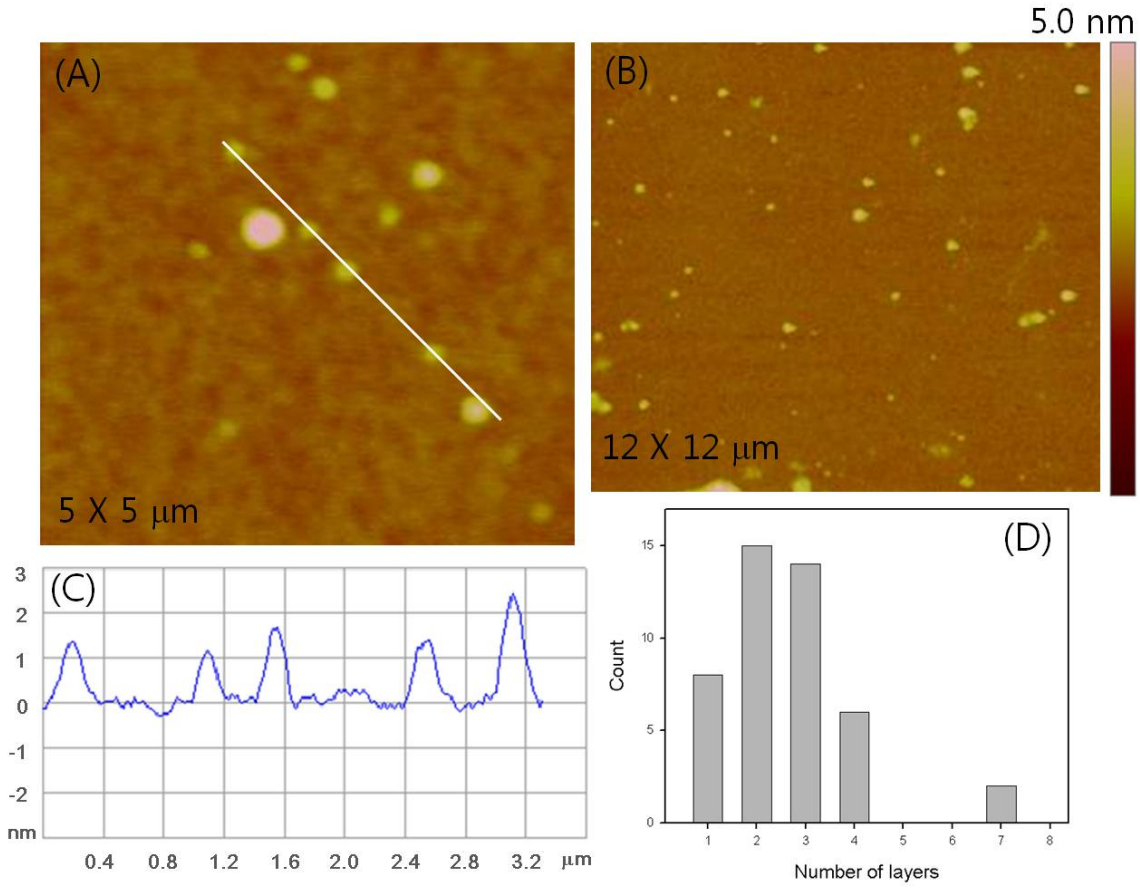

Fig. S4 Tapping-mode AFM images (A and B) of graphene film on SiO_2/Si substrate at different scan sizes, the corresponding line scan (C) of image A, and distribution histogram of thickness for graphene sheets.

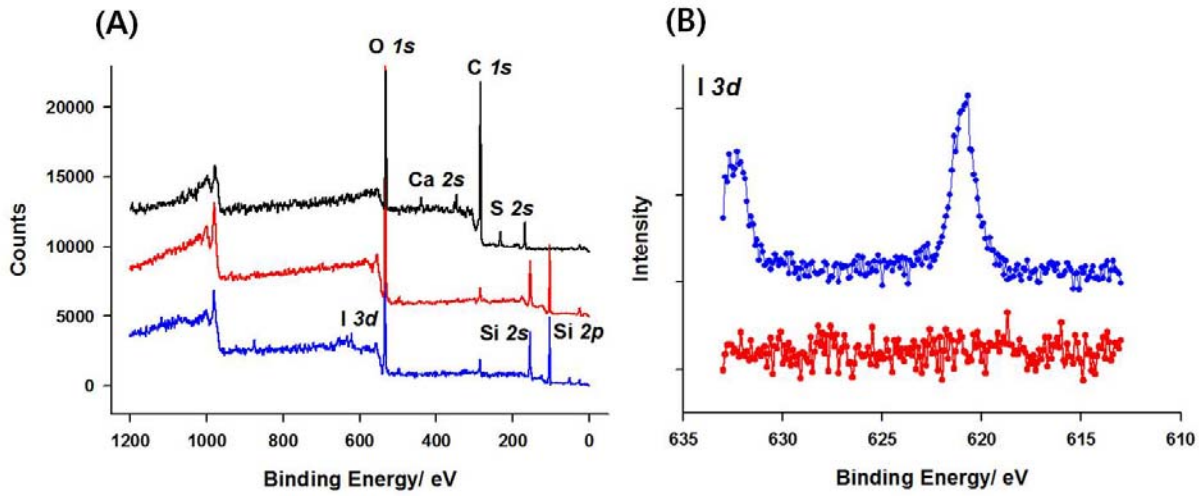

Fig. S5 XPS spectra for (A) survey and (B) I *3d* core level of pristine of EGF powder (black line), G-RB film (before thermal treatment, blue line), and graphene film (after thermal treatment, red line) on a SiO_2/Si substrate.

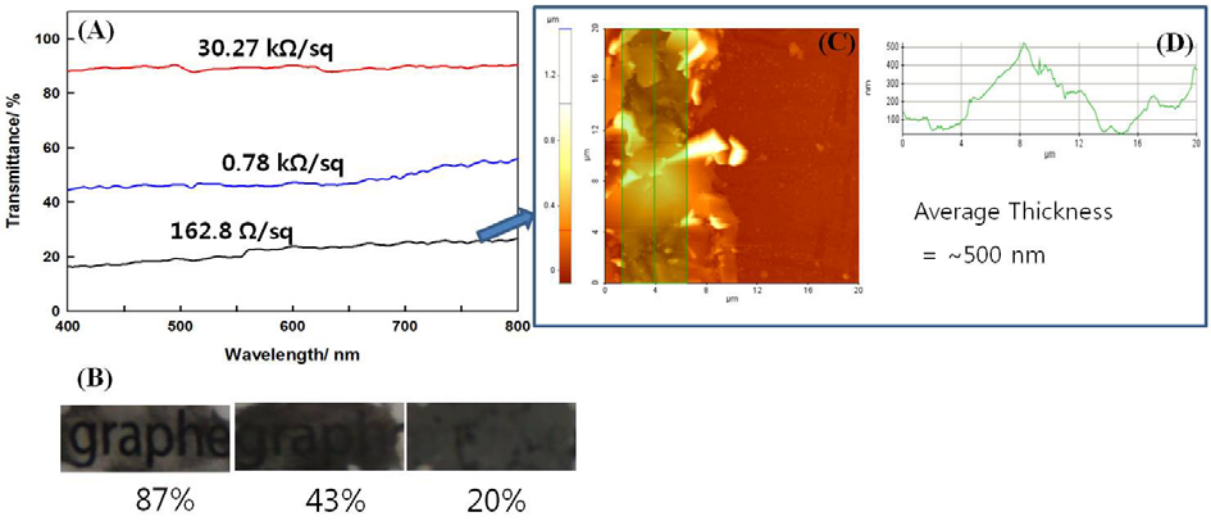

Fig. S6 (A) Transmittance and (B) optical image as different transmittances of mutilayered graphene films on PET substrates. (C) The AFM image and (D) average line-profile of the graphene film with transmittance of 20%.