Supporting Information

Freestanding Graphene Nanosheets and Large-area/patterned Graphene Nanofilms from Indium-catalyzed Graphite

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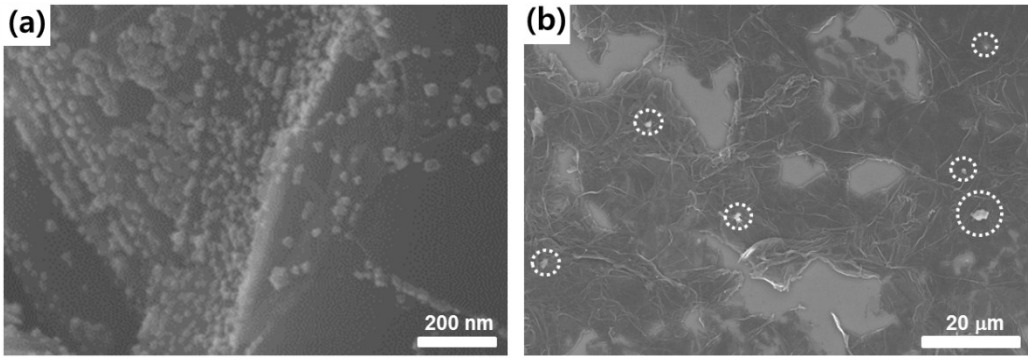

Fig. S1 (a) FESEM image of graphite powders annealed with In microparticles at 500 °C for 90 min. Nanometer-sized In particles are deposited on the surface graphite powder. (b) FESEM image of the graphite powder annealed with In particles at 800 °C for 90 min. The size of the graphite powders was decreased (circles in (b)) and carbon films were formed over the melted In layers.

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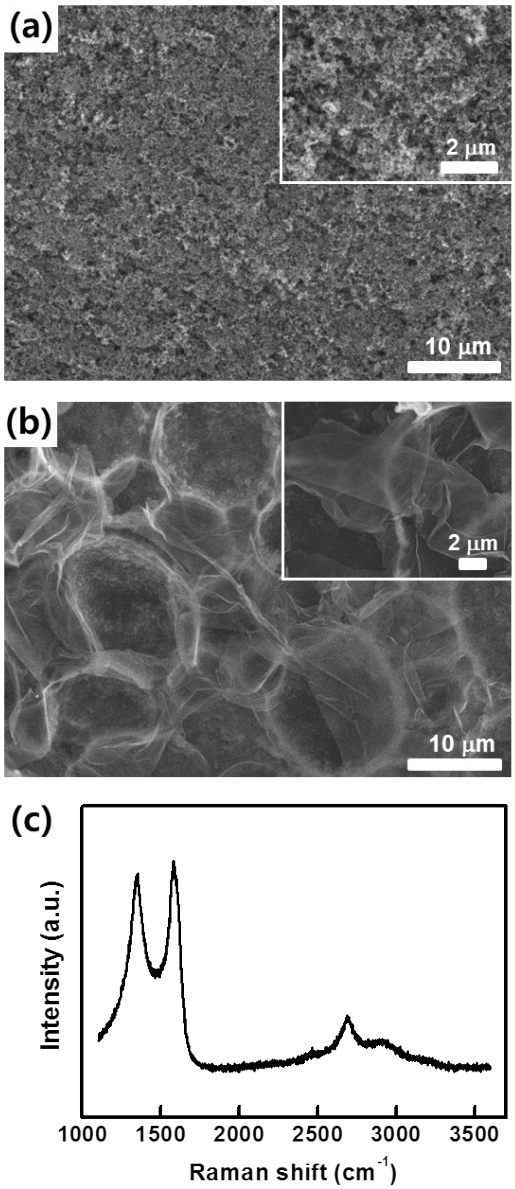

Fig. S2 (a) FESEM image of pristine amorphous carbon. Inset in (a): The pristine amorphous carbon is mainly composed of amorphous black carbon nanoparticles. (b) FESEM image of spherical-shaped graphene nanosheets synthesized at 900 °C for 90 min. Diameters of the holes range from 1 to 30 μm, which are well corresponding with the sizes of the In particles. Inset in (b): Magnified FESEM image of the spherical-shaped graphene nanosheet. (c) Raman spectrum of the nanosheets.

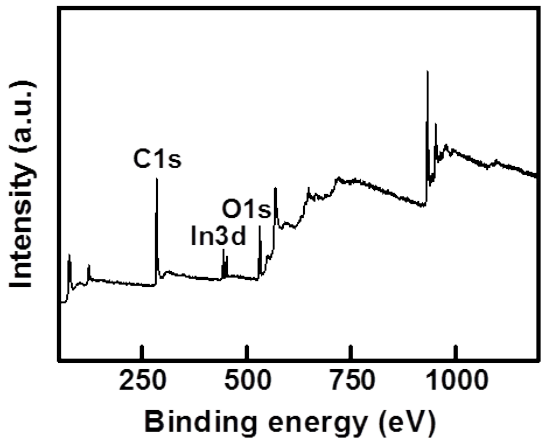

Fig. S3 XPS spectrum of graphene nanosheets synthesized on a Cu substrate after annealing processes at 900 ^{o}C for 90 min. A small amount of In was left on a Cu substrate. Except for C1s, O1s, and In3d peaks, other peaks in the XPS spectra are originated from the Cu substrate.

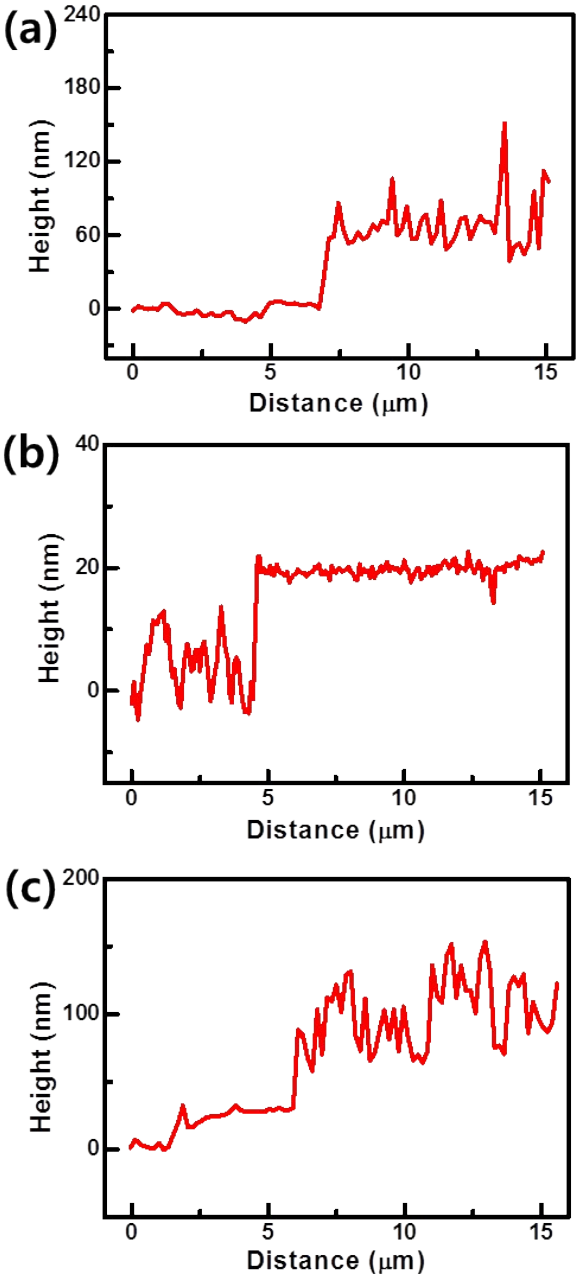

Fig. S4 Thicknesses of graphene nanofilms grown on SiO_2/Si substrates using In layers of (a) ~150, (b) ~70, and (c) ~250 nm thicknesses, respectively.

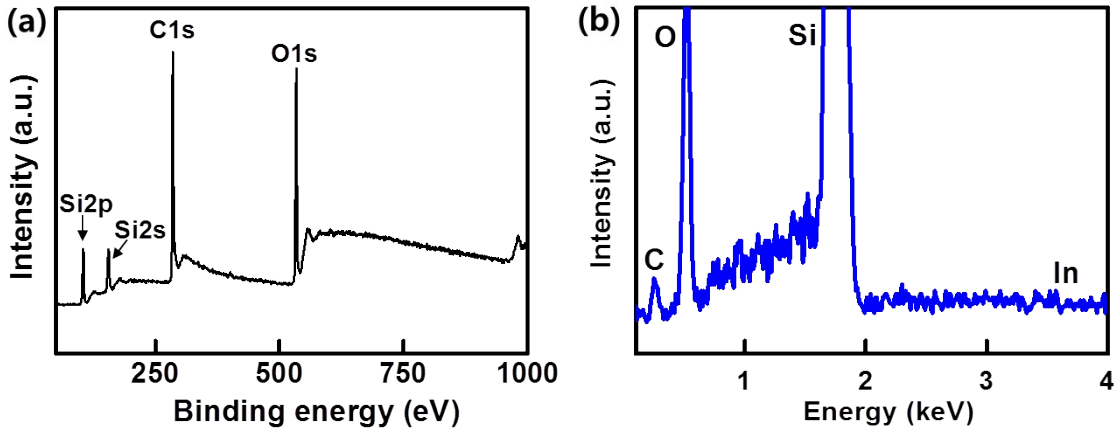

Fig. S5 (a) XPS spectrum of graphene nanofilms grown on a SiO_2/Si substrate. (b) Measured EDX spectrum of graphene nanofilms grown on a SiO_2/Si substrate.