Supporting Information

Copper Vapor-Assisted Chemical Vapor Deposition for High Quality and Metal-Free Single Layer Graphene on Amorphous SiO_2 Substrate

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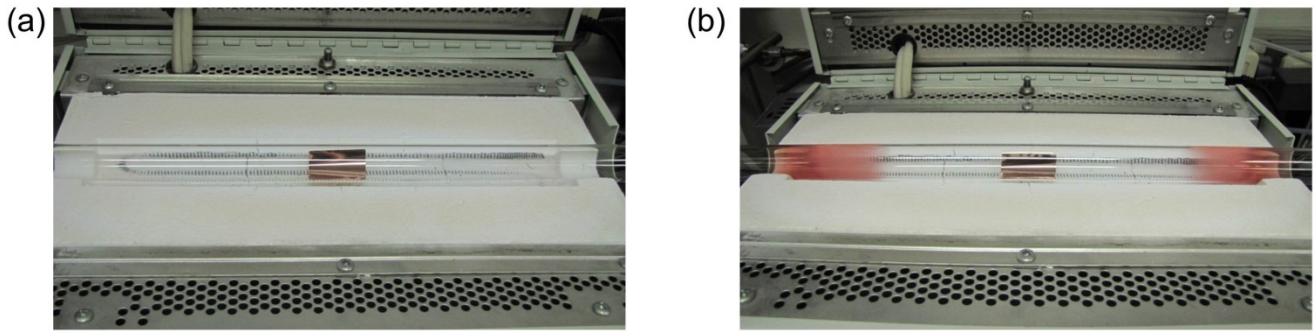

Figure S1. Photographs of (a) before and (b) after growing graphene on Cu foil at 1000 ^{o}C. Cu deposits are formed on both downstream and upstream sides of protecting quartz tube.

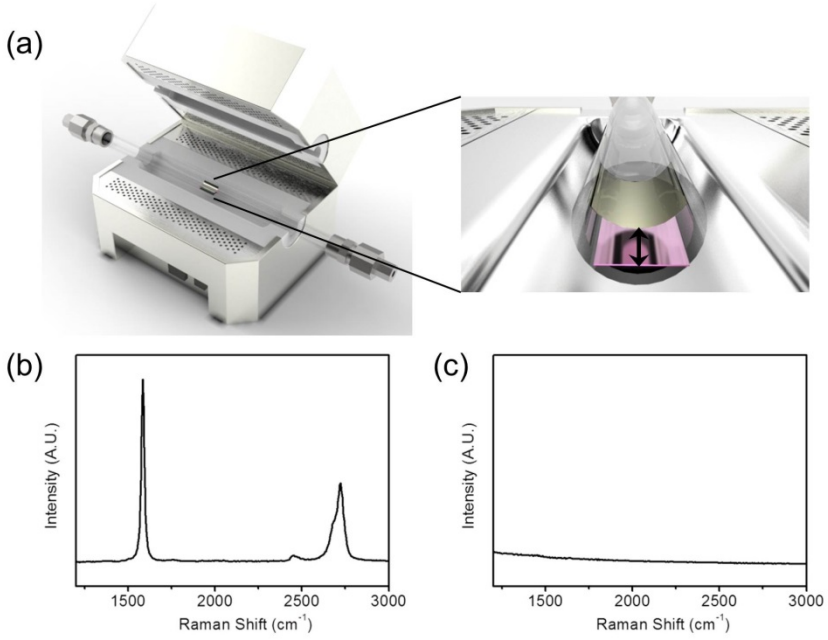

Figure S2. (a) Scheme of Ni vapor-assisted CVD process. Raman spectra (b) showing the formation of multilayer graphene on Ni foil and (c) no graphene formed on SiO_2/Si substrate after the growth.

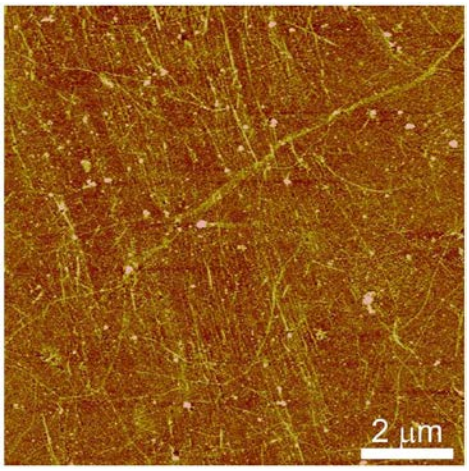

Figure S3. AFM image of transferred SLG grown in Cu foil onto SiO_2/Si substrate.

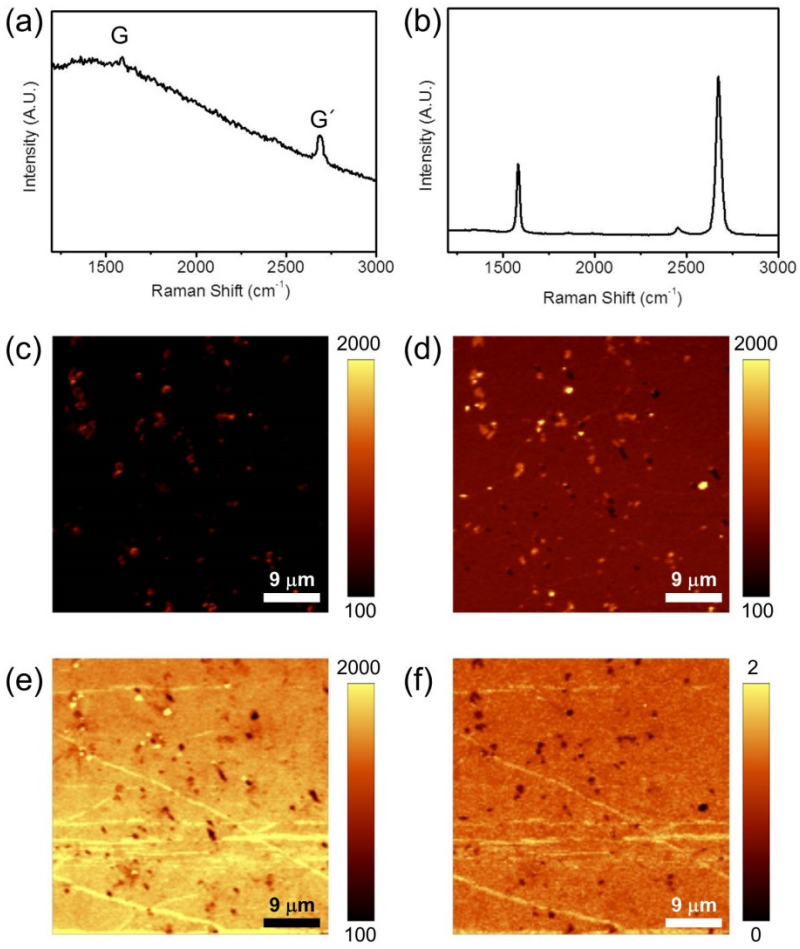

Figure S4. (a) Representative Raman spectrum of SLG grown on Cu foil by regular CVD process. (b) Raman spectrum taken after transferring the SLG of (a) onto a fresh SiO_2/Si. (c – f) Scanning Raman images mapped with the intensities of D, G, G' band, and intensity ratio of G' and G ($I_{G'}/I_G$), respectively, for the SLG grown on a SiO_2/Si substrate by Cu vapor-assisted CVD process.

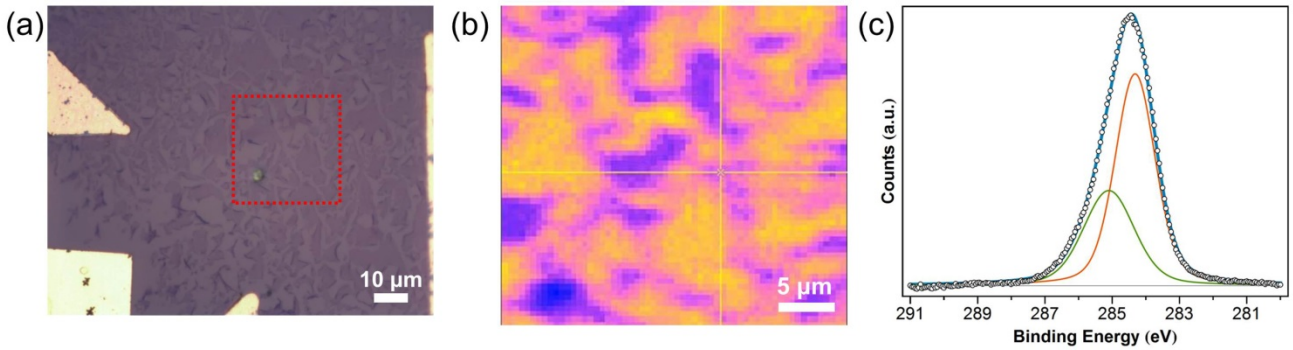

Figure S5. (a) Optical image of graphene on SiO_2/Si, (b) SPEM image mapped with C1s corresponding to red square in (a), (c) XPS spectra of C 1s when the X-ray beam was defocused, which show the peak of 281.9 eV was originated from charging effect.