

Supplementary Information for:

High-efficiency Graphene/Si Nanoarray Schottky Junction Solar Cells via Surface Modification and Graphene Doping

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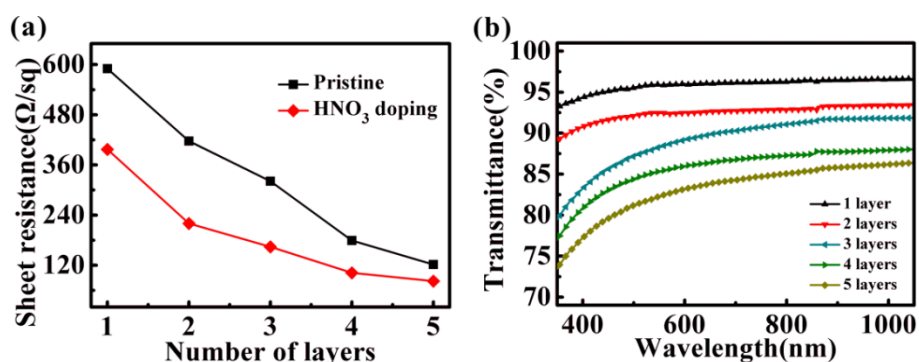


Fig. S1 (a) Plots of sheet resistance as a function of layer number of the FLG film before and after HNO₃ doping. (b) Transmittance of FLG film with varied layer number.

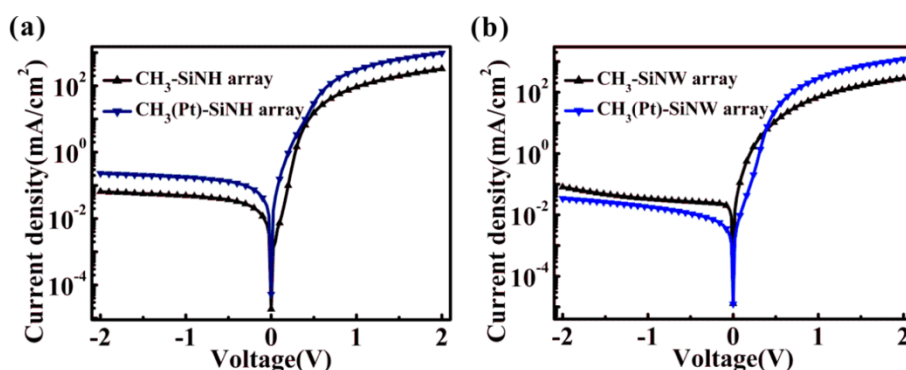


Fig. S2 (a) *I-V* characteristics of the 4-layer FLG/CH₃-SiNH array and 4-layer FLG/CH₃(Pt)-SiNH array in dark. (b) *I-V* characteristics 4-layer FLG/CH₃-SiNW array and 4-layer FLG/CH₃(Pt)-SiNW array in dark.

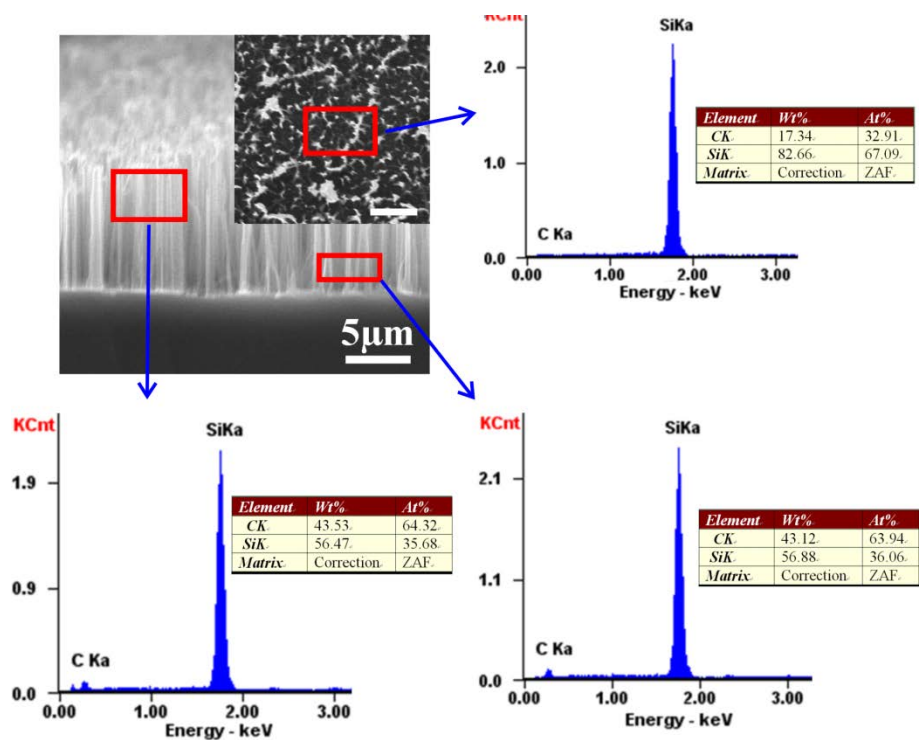


Fig. S3 EDS analysis on the P3HT coated SiNW array. The strong C signals observed from both top and side surfaces indicate the uniform coating of P3HT layer on the SiNW array.

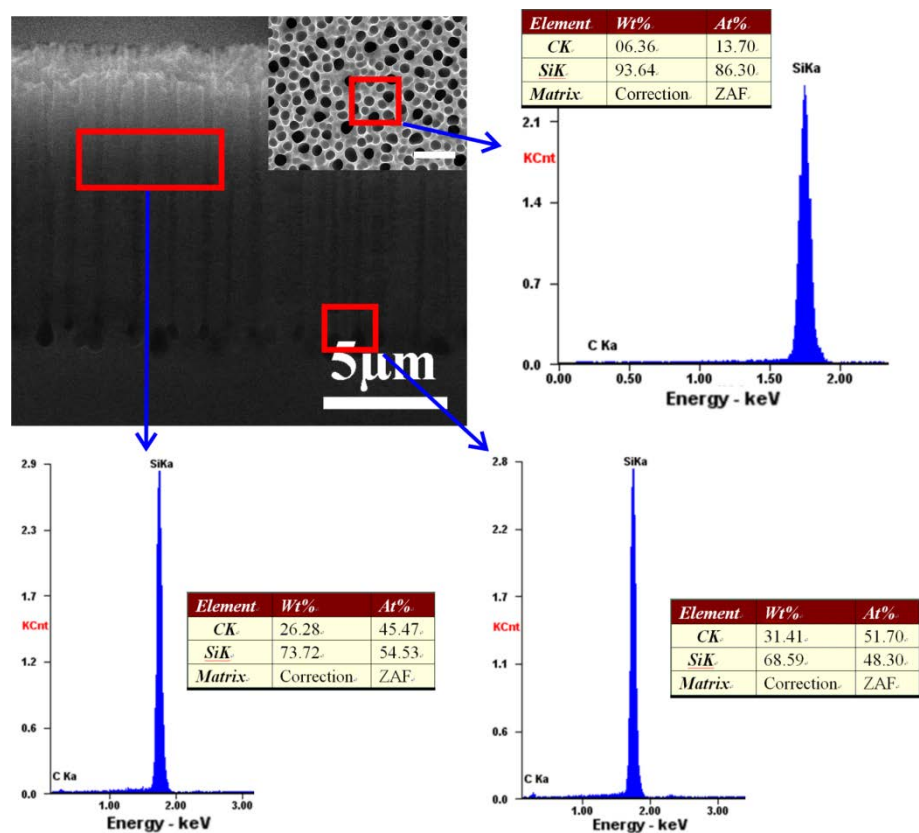


Fig. S4 EDS analysis on the P3HT coated SiNH array. The strong C signals observed from both top surface and side walls indicate the uniform coating of P3HT layer on the SiNH array.

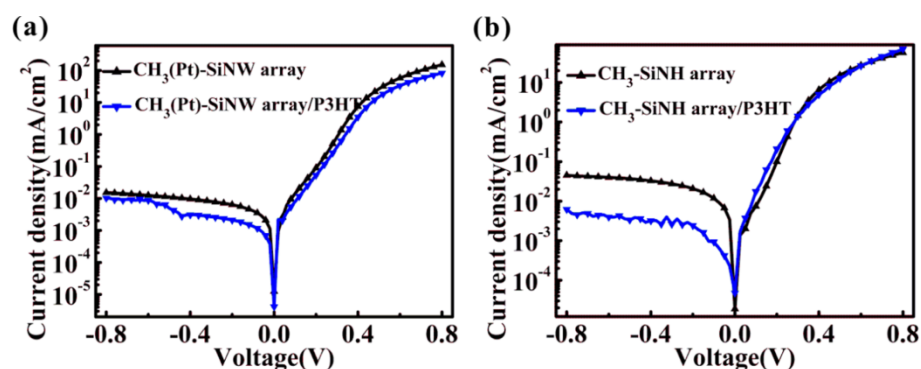


Fig. S5 (a) *I-V* characteristics of the 4-layer FLG/CH₃(Pt)-SiNW array with and without P3HT electron blocking layer in dark. (b) *I-V* characteristics of 4-layer FLG/CH₃-SiNH array with and without P3HT electron blocking layer in dark.

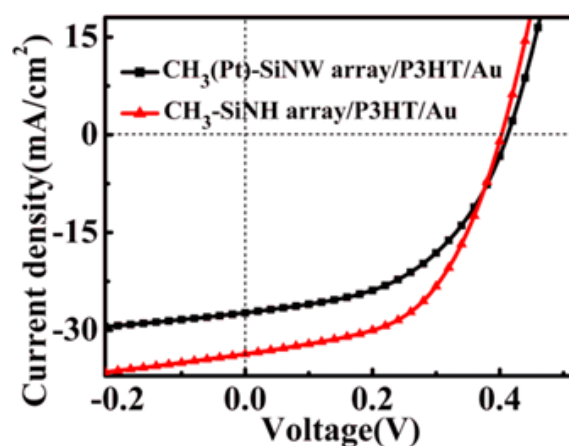


Fig. S6 Photovoltaic characteristics of CH₃(Pt)-SiNW array/P3HT (10 nm) and CH₃-SiNH array/P3HT (10 nm) hybrid heterojunction solar cells with 13 nm Au as anode electrodes. The corresponding PCEs are 5.53% and 7.14%, respectively.

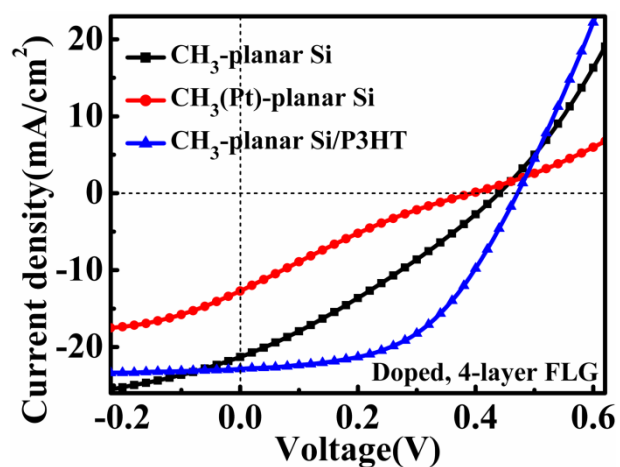


Fig. S7 Photovoltaic characteristics of 4-layer FLG/CH₃-planar Si, 4-layer FLG/CH₃(Pt)-planar Si and 4-layer FLG/P3HT/CH₃-planar Si after HNO₃ doping. The corresponding PCEs are 2.96%, 1.07% and 5.18%, respectively.