

Electronic Supplementary Material

Vertically stacked holey graphene/polyaniline heterostructures with enhanced energy storage for on-chip micro-supercapacitors

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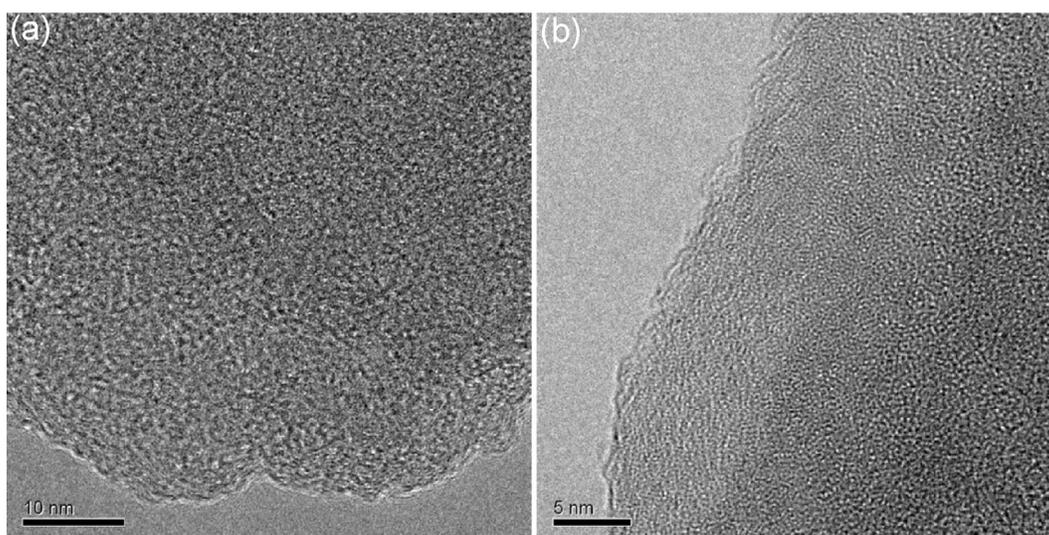


Figure S1 (a) and (b) TEM images of as-prepared h-Graphene interlayers.

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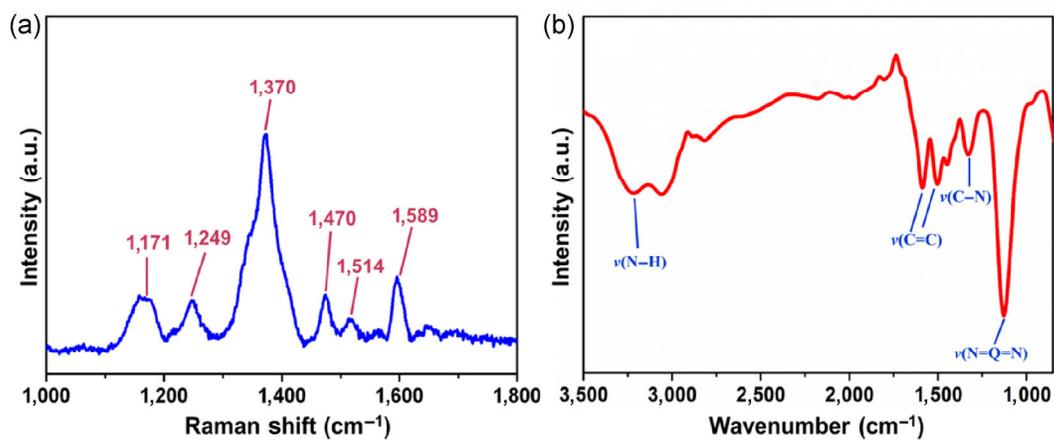


Figure S2 (a) Raman spectrum and (b) FTIR spectrum of pure PANI film without patterned interdigital structures.

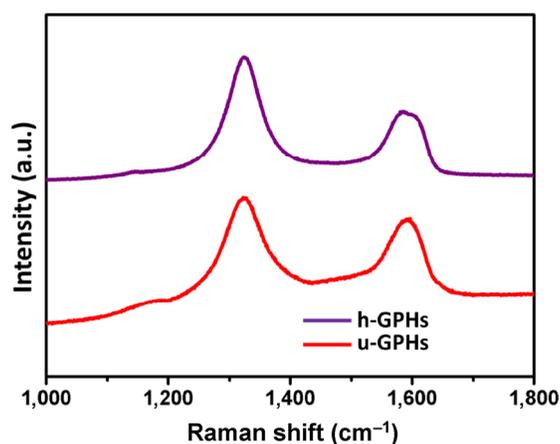


Figure S3 The Raman spectra of on-chip u-GPHs and h-GPHs-based MSCs.

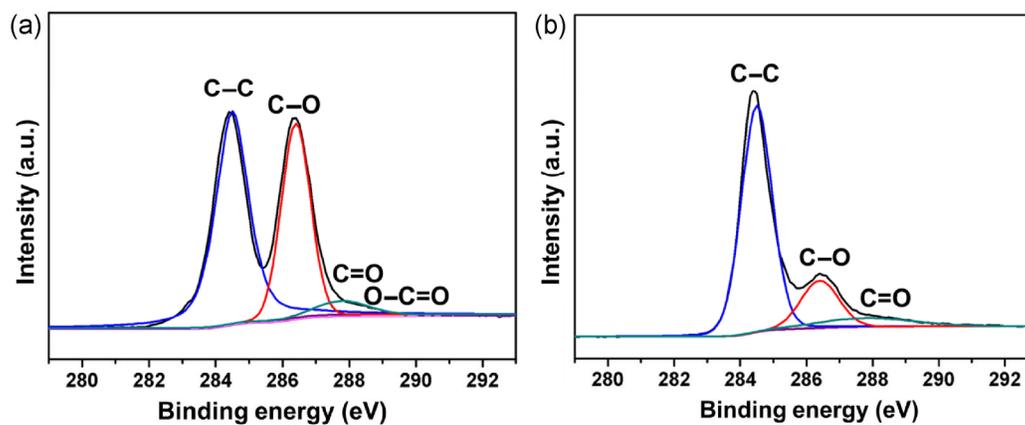


Figure S4 XPS spectra of C 1s for (a) pure h-Graphene oxides and (b) reduced h-Graphene oxides film without patterned interdigital structures.

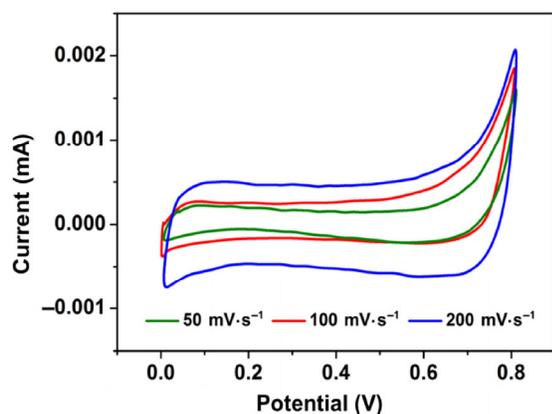


Figure S5 CV curves of holey graphene based on-chip MSCs at various scan rates in the potential window from 0 to 0.8 V.

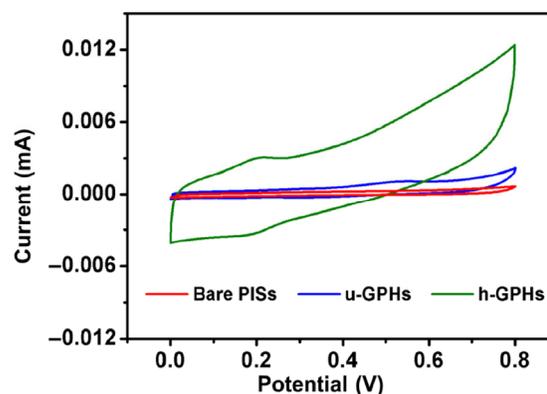


Figure S6 CV curve of MSCs at $20 \text{ mV}\cdot\text{s}^{-1}$ in the potential window from 0 to 0.8 V.

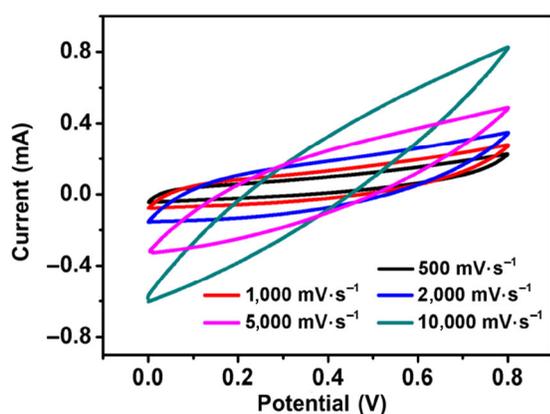


Figure S7 CV curves of h-GPHs based MSCs from $500 \text{ mV}\cdot\text{s}^{-1}$ to $10,000 \text{ mV}\cdot\text{s}^{-1}$ in $1 \text{ M H}_2\text{SO}_4$ in the potential window from 0 to 0.8 V.

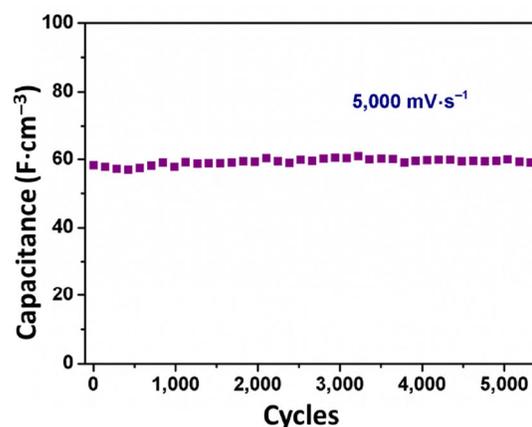


Figure S8 Cycling performance of h-GPHs-based MSCs.

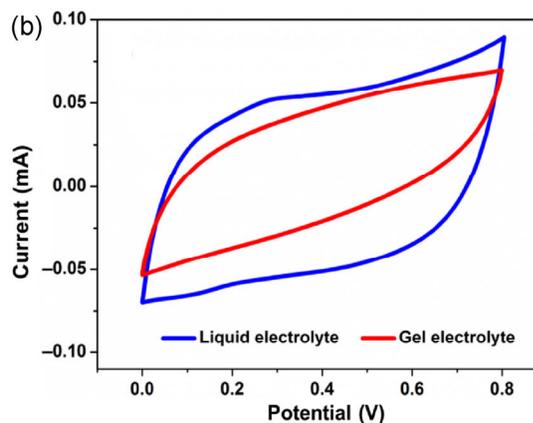
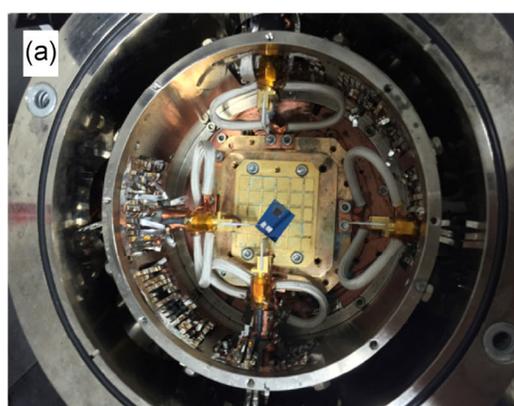


Figure S9 (a) Digital image of all-solid-state h-GPHs-based MSCs during the electrochemical tests. (b) CV curves of h-GPHs-based MSCs in liquid electrolyte and gel electrolyte.

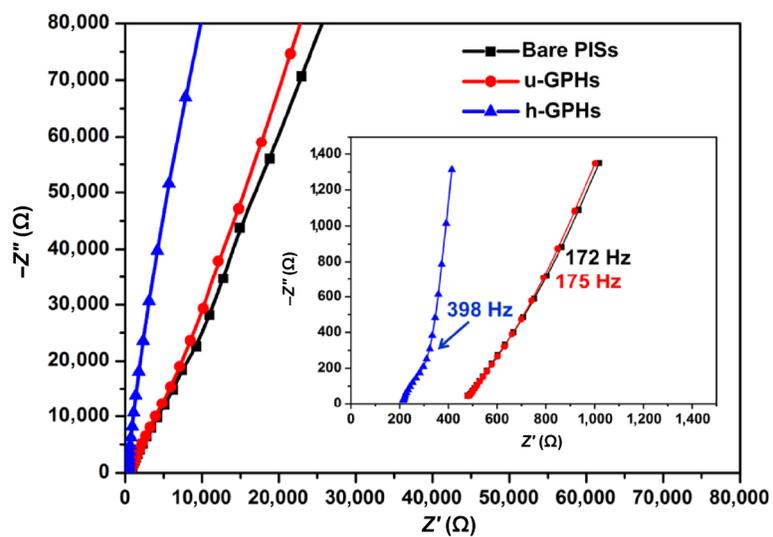


Figure S10 AC impedance spectra of h-GPHs, u-GPHs, and bare PISs-based MSCs from 100 kHz to 0.1 Hz.

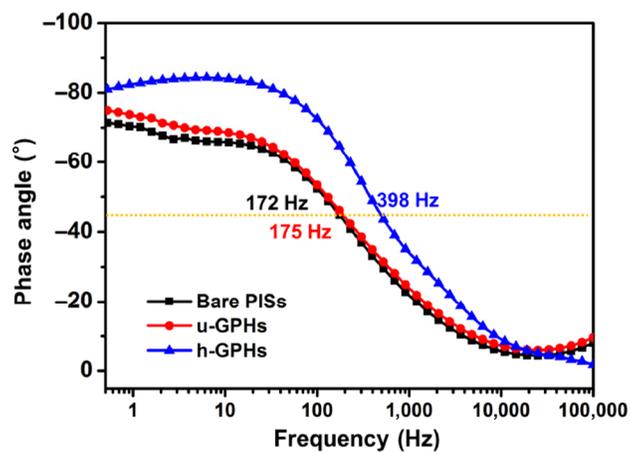


Figure S11 Bode plot for bare PISs, u-GPHs, and h-GPHs-based MSCs.