

Supplementary Information

Simple Fabrication of Laser-Induced Graphene Functionalized with a Copper-Based Metal–Organic Framework and its Application in Solid-state Supercapacitors

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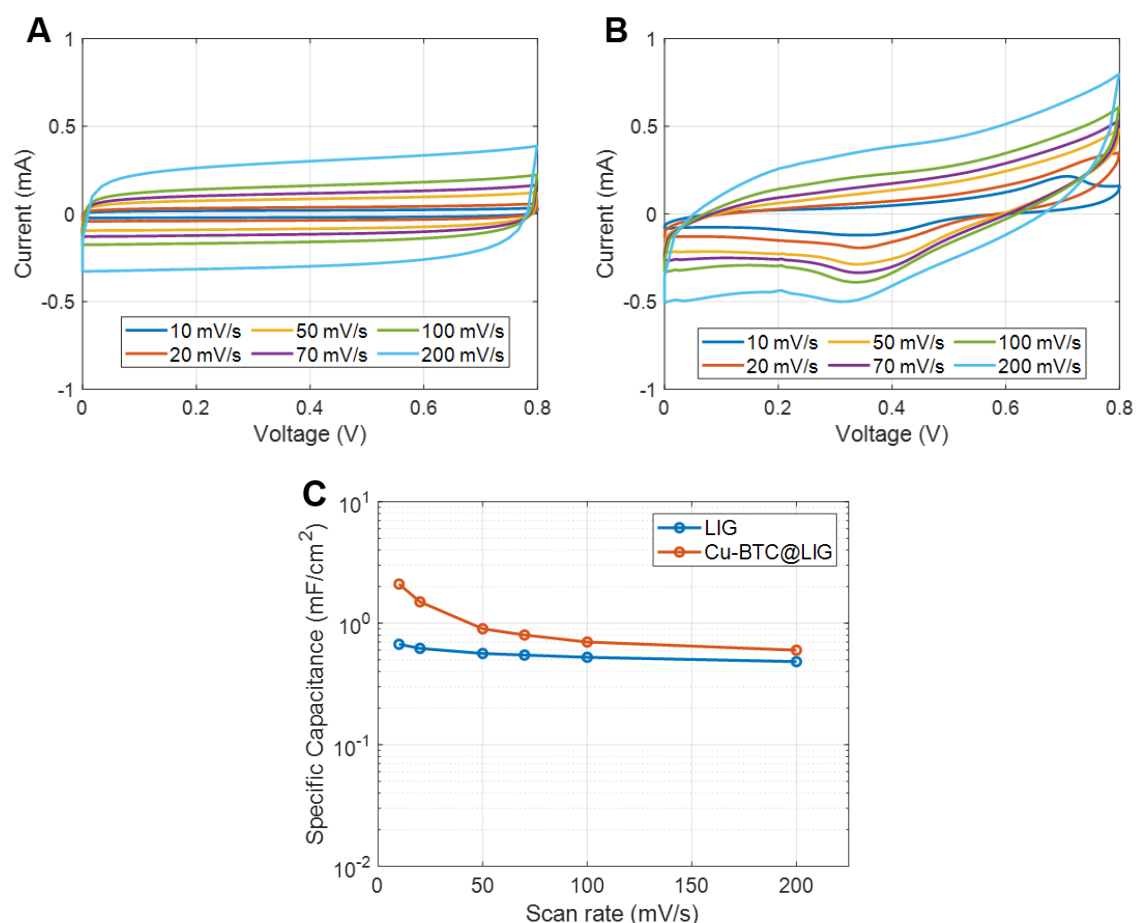


Fig. S1. Additional Cyclic Voltammetry (CV) experiments for an IDE structure with the following characteristics: number total of fingers $N = 13$, width of the fingers $W = 1$ mm, spacing between electrodes $S = 0.5$ μm , interspacing between fingers $i = 0.5$ μm and length of the fingers $L = 11$ mm. (A) CV curves at different scan rates for the LIG electrodes. (B) CV curves at different scan rates for the Cu-BTC@LIG electrodes. (D) Specific capacitance as a function of the scan rate for both LIG and Cu-BTC@LIG electrodes.

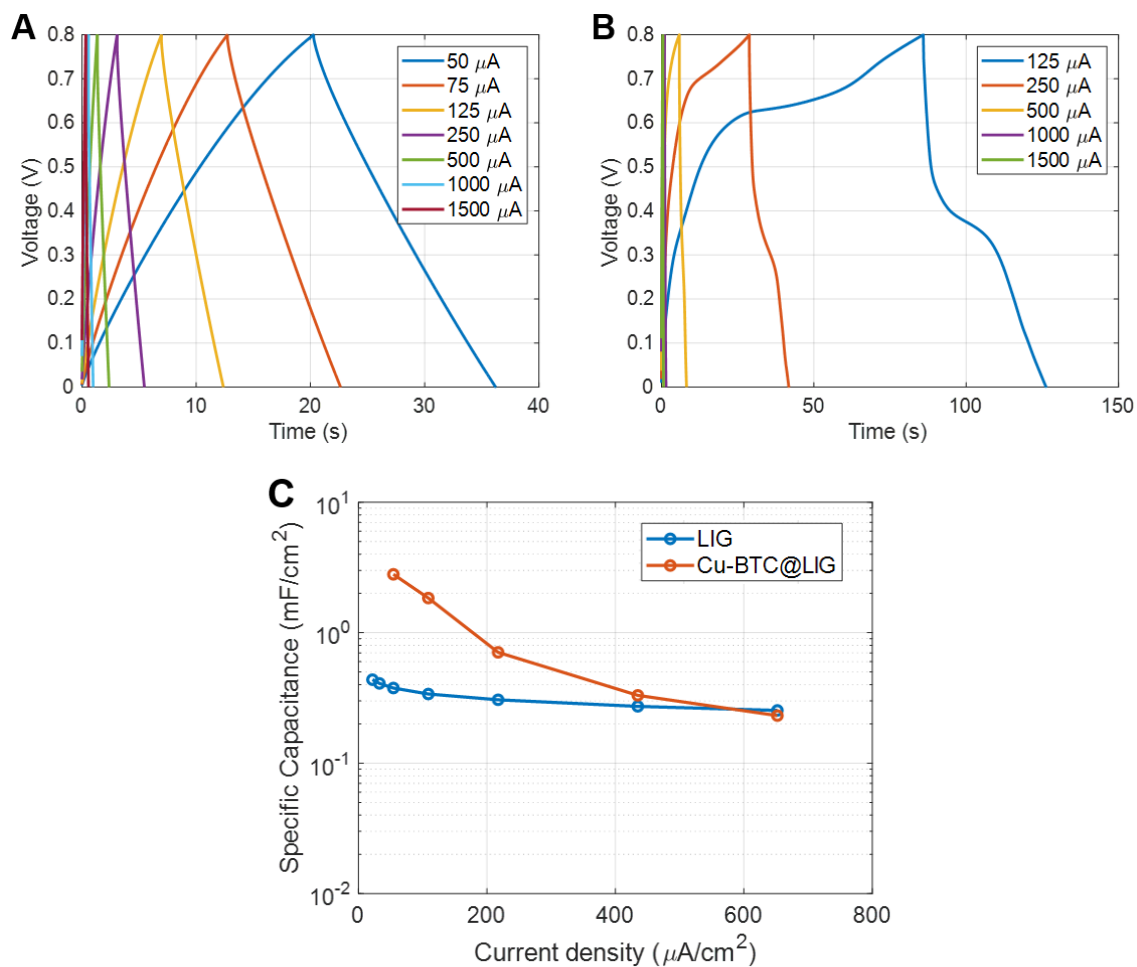


Fig. S2. Additional Galvanometric charge-discharge curves at different constant currents for an IDE structure with the following characteristics: number total of fingers $N = 13$, width of the fingers $W = 1$ mm, spacing between electrodes $S = 0.5 \mu\text{m}$, interspacing between fingers $i = 0.5 \mu\text{m}$ and length of the fingers $L = 11$ mm. (A) Curves at different constant currents for the LIG electrodes. (B) Curves at different constant currents for the Cu-BTC@LIG electrodes. (C) Specific capacitance as a function of the current density for both LIG and Cu-BTC@LIG electrodes.

Table S1. Specific capacitance before and after the LIG functionalization with different materials.

LIG Functionalizer	Electrolyte	C_A (mF/cm ²) (before)	C_A (mF/cm ²) (after)	Reference
Cu-BTC	PVA/H ₃ PO ₄	0.37 @ 54.3 $\mu\text{A cm}^{-2}$	2.8 @ 54.3 $\mu\text{A cm}^{-2}$	This work
Cu	PVA/KOH	0.8 @ 100 mV s ⁻¹	1.1 @ 100 mV s ⁻¹	13
Ag			1.2 @ 100 mV s ⁻¹	
MoS ₂	PVP+NaCl	-	14 @ 10 mV s ⁻¹	78
MnO ₂	PVA/H ₃ PO ₄	-	18.82 at 200 $\mu\text{A}/\text{cm}^2$	84
B	PVA/H ₂ SO ₄	5.5 @ 50 $\mu\text{A cm}^{-2}$	16.5 @ 50 $\mu\text{A cm}^{-2}$	85
SnO ₂	PVA/H ₂ SO ₄	3.59 @ 10 mV s ⁻¹	18.58 @ 10 mV/s	88
LIG-ZIF-67	PVA/H ₂ SO ₄	2 @ 500 $\mu\text{A cm}^{-2}$	3 @ 500 $\mu\text{A cm}^{-2}$	29
LIG-(MOF-199@ZIF-67)	H ₂ SO ₄ (aqueous)	-	6.2 @ 10 mV s ⁻¹ 5 @ 200 $\mu\text{A cm}^{-2}$	27