Supplementary data

Laser Cutting Coupled with Electro-exfoliation to Prepare Versatile Planar Graphene Electrodes for Energy Storage

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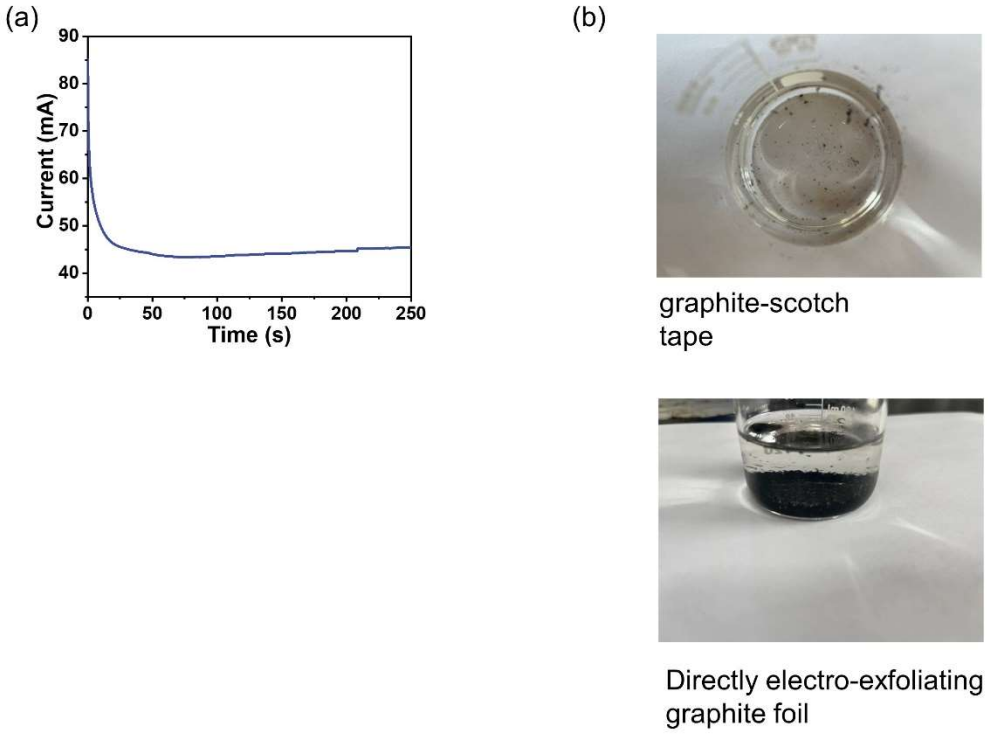


Figure S1 (a) a typical exfoliation current for a piece of graphite foil; (b) Respective photographs of the final solution that exfoliates graphite-scotch tape and a piece of graphite under a same condition.

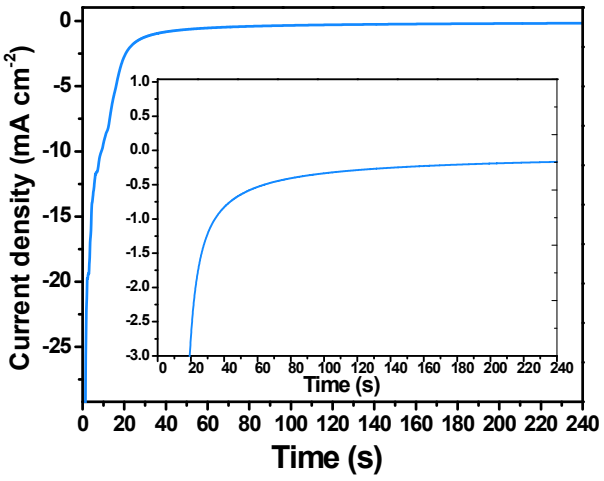


Figure S2 the activation current profile of the G-240 at the potential of 0V for 240s.

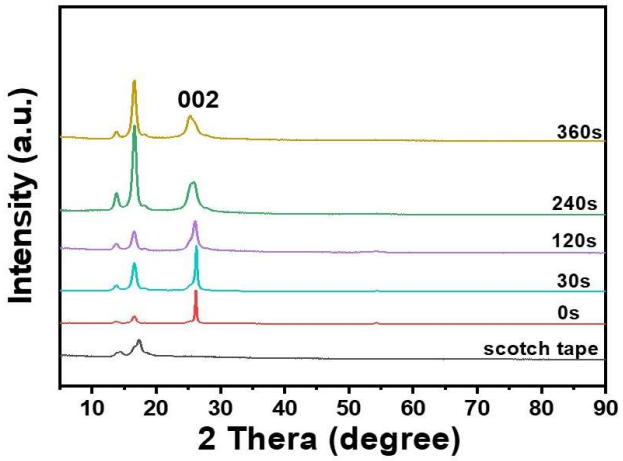


Figure S3 the XRD pattern of the set of graphite samples exfoliated at various times.

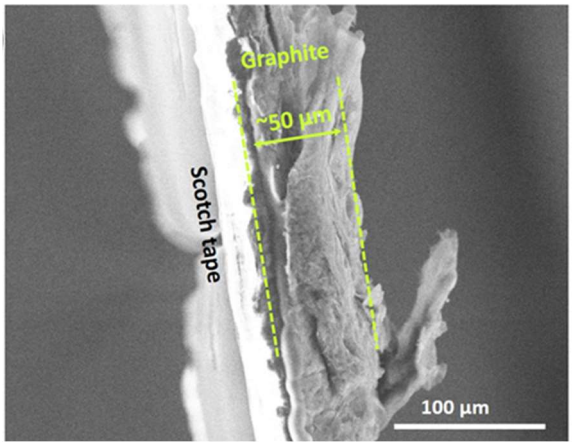


Figure S4 the cross-section SEM view of the original graphite/scotch tape electrode.

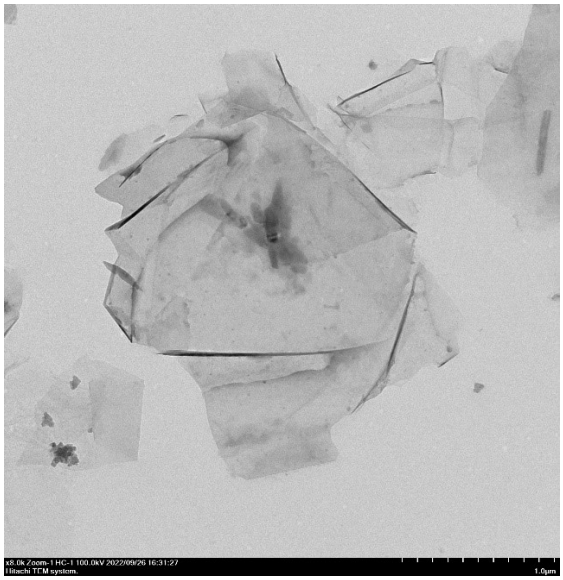


Figure S5 the TEM image of the G-240.

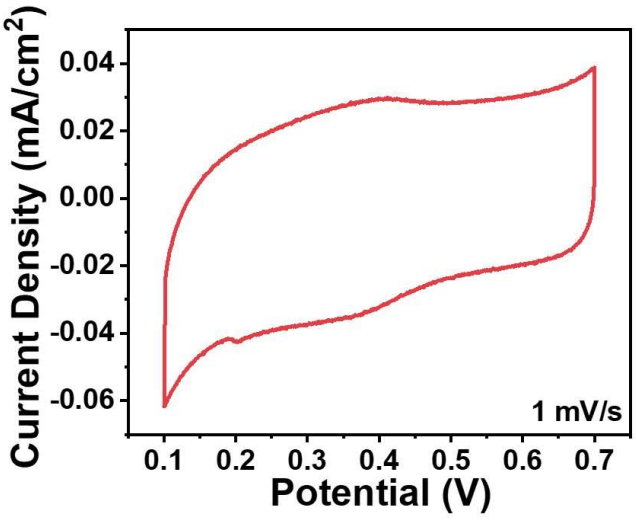


Figure S6 the CV curve of the G-240 at a scan rate of 1 mV s^{-1} in 1M H_2SO_4 with a reference of Ag/AgCl (3 M).

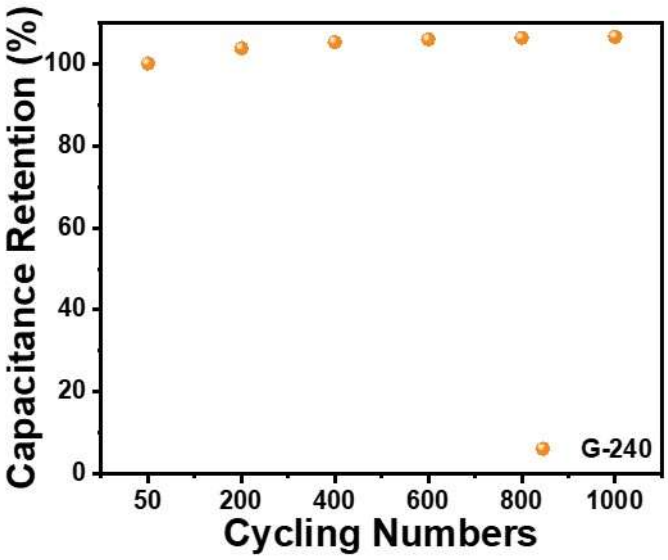


Figure S7 the cycling performance of G-240 at a scan rate of 100 mV s^{-1}.

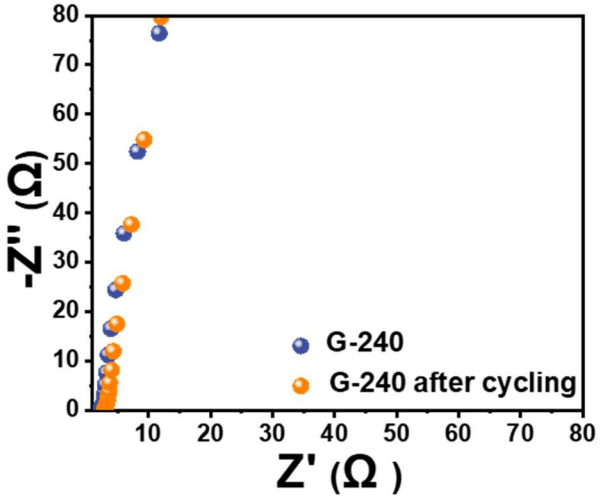


Figure S8 the impedance spectra of G-240 and G-240 after long-term cycling at OCP in the frequency range from 100 kHz to 0.1 Hz.

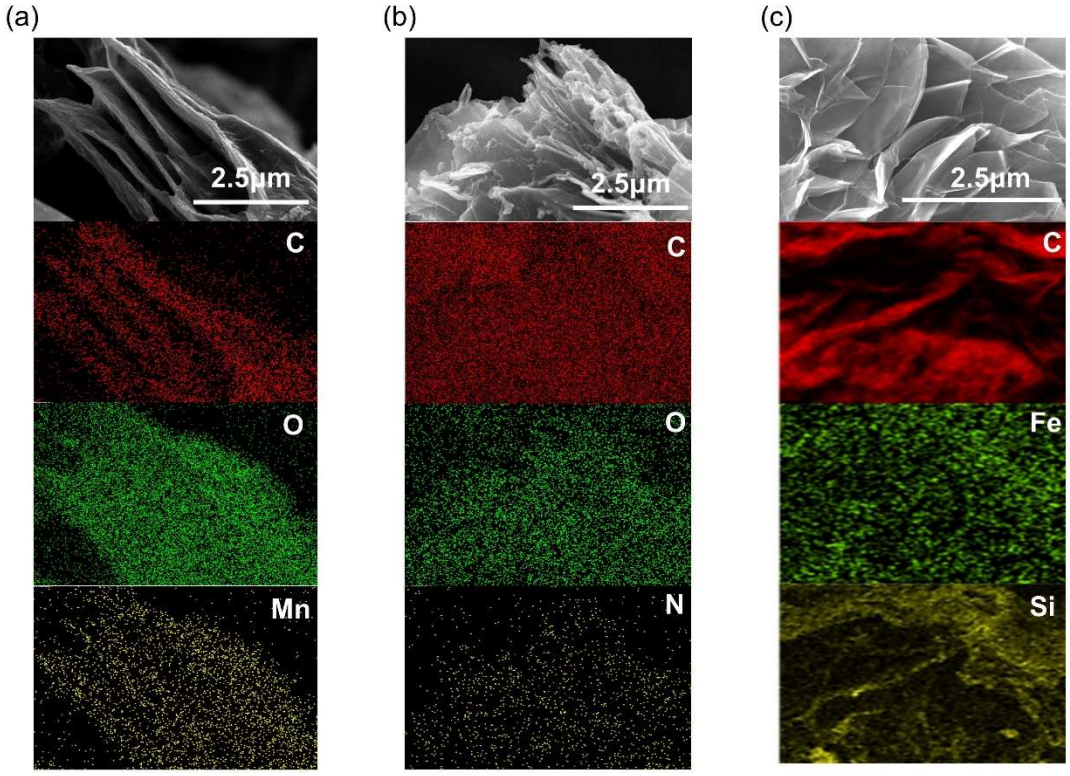


Figure S9 the corresponding elements mapping results of (a) MnO_2, (b) PANI, and (c) Fc-MS functionalized samples to show their homogeneous distribution.

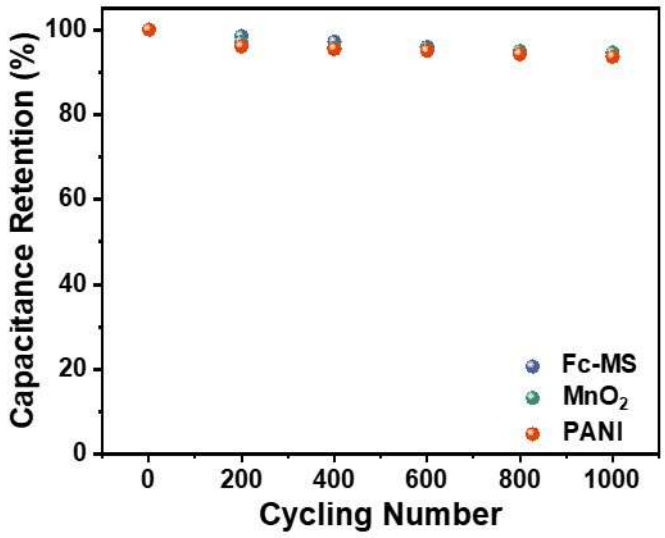


Figure S10 the cycling performance of Fc-MS, MnO_2, and PANI at a scan rate of 100 mV s^{-1}.

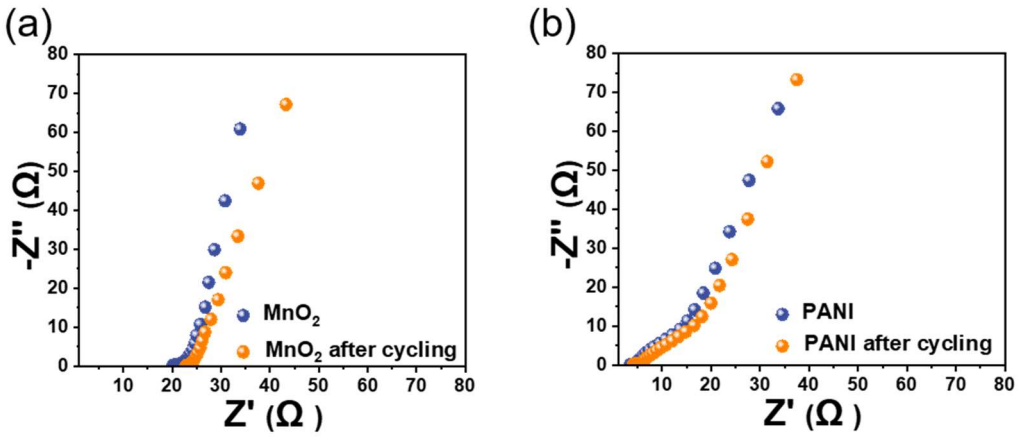


Figure S11 the impedance spectra of MnO_2 (a) and PANI (b) before and after long-term cycling at OCP in the frequency range from 100 kHz to 0.1 Hz.

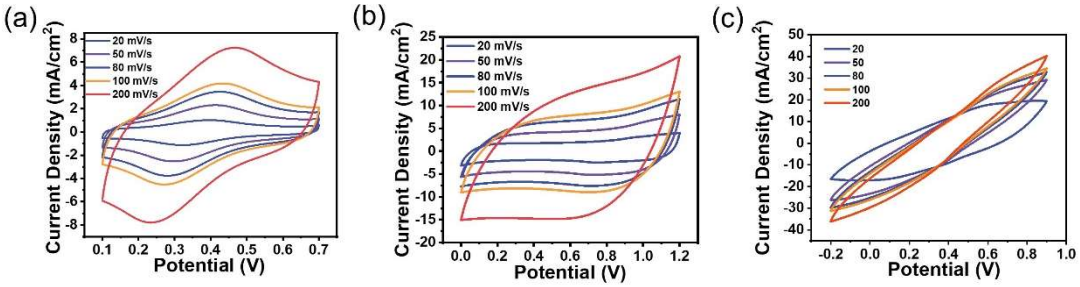


Figure S12 the CV curves of Fc-MS (a), MnO_2 (b), and PANI (c) at scan rates ranging from 20 mV s^{-1} to 200 mV s^{-1} (*vs.* Ag/AgCl 3 M).

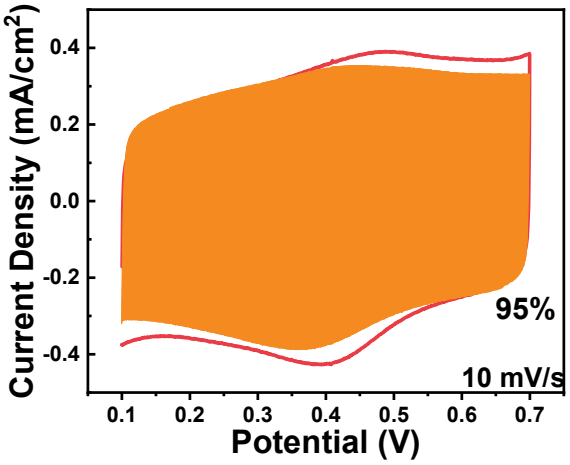


Figure S13 the surface-controlled current ratio of G-240 at a scan rate of 10 mV s^{-1}.

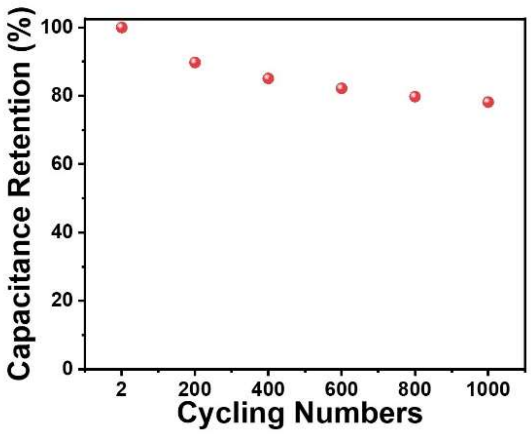
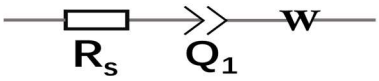
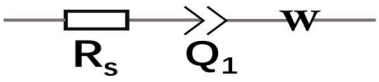


Figure S14 the cycling performance of the PANI symmetrical device.

Table S1 the impedance fitting parameters of the graphite, G-240, and G-240 before activation.

Samples	R_s/Ω	$Q_1/F*s^{(a1)}$	a_1	R_{ct}/Ω	$s_2/\Omega*s^{(-0.5)}$	Equivalent circuits
graphite	0.7048	0.06246	1		16.18	
G-240	2.216	0.02161	0.9831		2.679	
G-240 before activation	1145	$7.654*10^{-5}$	0.3253	7703	$6.547*10^{-12}$