Supplementary Information (SI) for Journal of Materials Chemistry C.

Supporting Information

Laser-induced graphene based on a controllable angle between two irradiation steps for the flexible sensor

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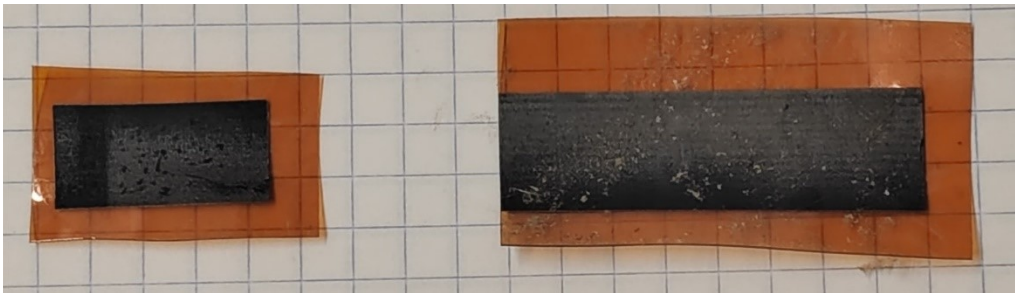

Fig. S1 Aging changes of LIG films at room temperature. The left picture is LIG film. The right picture shows the LIG film being retained at room temperature for 240 days.

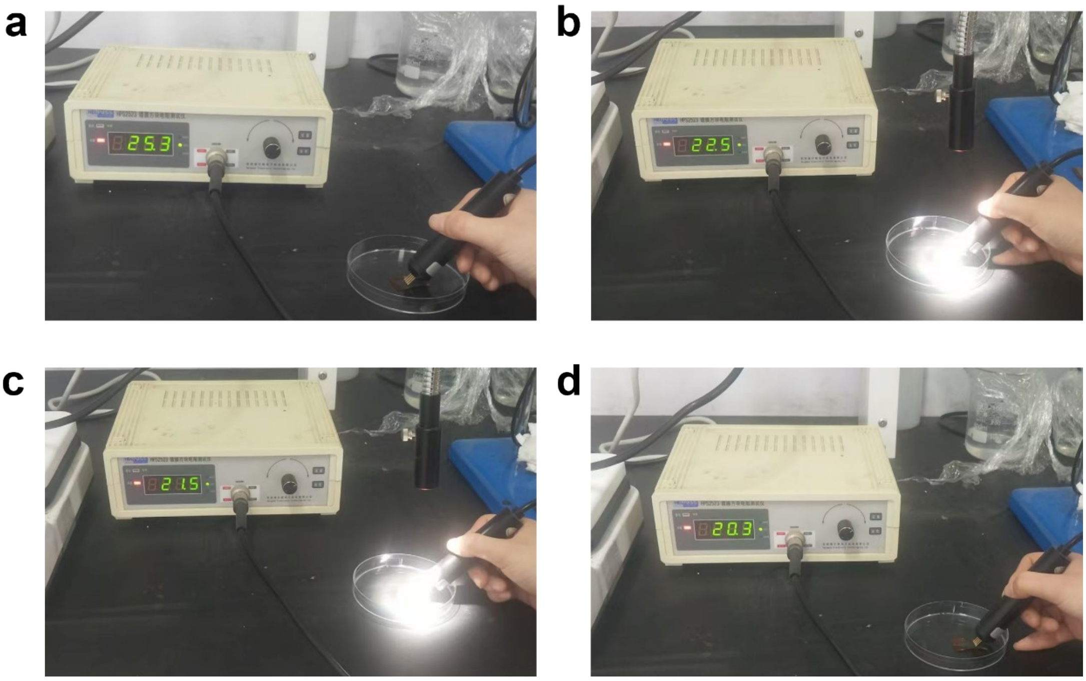

Fig. S2 The persistent photoconductive effects test of LIG. The resistance of LIG after light exposure for 0 **(a)**, 5 **(b)**, 10 **(c)** and 15 **(d)** minutes.

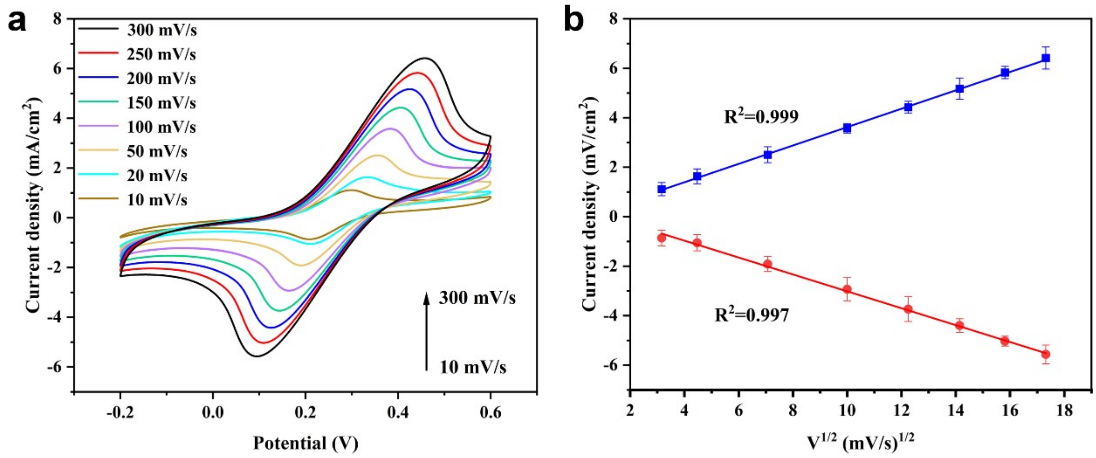

Fig. S3 Cyclic voltammetry (CV) measurements conducted at different scan rates (10, 20, 50, 100, 150, 200, 250, 300 mV·s^{-1}) of the LIG with 0° twisted angle **(a)**. Peak current plotted as a function of the square root of the scan rate with fitted linear regression curves in 5 mM $K_3[Fe(CN)_6]$ and 0.30 M KCl. Blue and red dots indicate anodic and cathodic peak currents, respectively **(b)**.

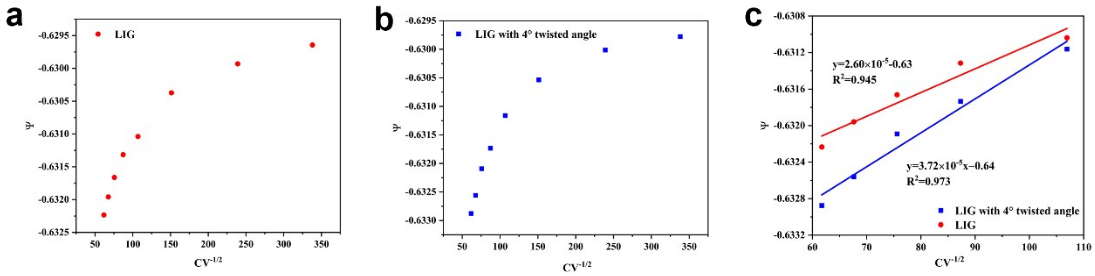

Fig. S4 The data of LIG with twisted angles of 0° **(a)** and 4° **(b)** for calculating the rate of heterogeneous electron transfer (HET). The linear fitting curve for calculating the HET rate **(c)**.

Table S1 Performance comparison between the electrochemical sensor from this work and the other carbon nanomaterial-based sensors reported in the literature.

Electrode material	Detection method	Analyte	Sensitivity of UA ($\mu A\ \mu M^{-1}\ cm^{-2}$)	LOD of UA (μM)	HET rate (k^0)	Ref
LIG with 4° twisted angle	DPV	UA	1.68 ± 0.021	8.62 ± 0.15	$3.72 \times 10^{-5} \pm 1.03 \times 10^{-5}$	This work
LIG with 0° twisted angle	DPV	UA	0.95 ± 0.018	15.6 ± 0.23	$2.60 \times 10^{-5} \pm 0.84 \times 10^{-5}$	This work
FMWCNT	CV/DPV	UA	0.4114	19	/	[1]
Uricase/Au–rGO/ITO	DPV	UA	/	7.32	/	[2]
ZnO@CNTs/CC	DPV	UA	0.11	0.88	/	[3]

References

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2. W. Shi, J. Li, J. Wu, Q. Wei, C. Chen, N. Bao, C. Yu and H. Gu, *Analytical and Bioanalytical Chemistry*, 2020, **412**, 7275-7283.
3. F. Wang, F. Shi, J. Li, N. Chen, C. Chen, Z. Xu and J. Wang, *Microchemical Journal*, 2023, **193**, 109054.