Electronic Supplementary Material (ESI) for Analytical Methods.

Supporting Information

A green electrochemical sensor based on poly(ionic liquids)-graphene nanocomposite modified electrode for Sudan I determination

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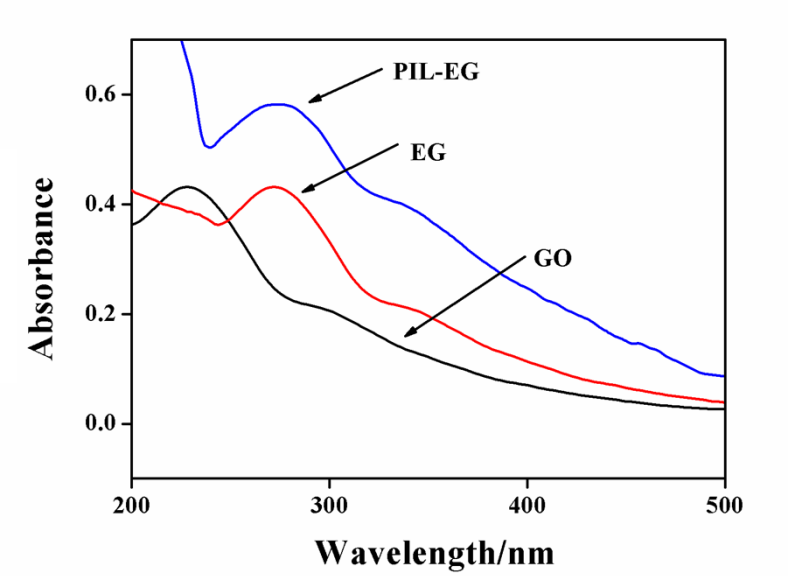

Fig.S1. UV-vis spectra of GO, EG and PIL-EG in water

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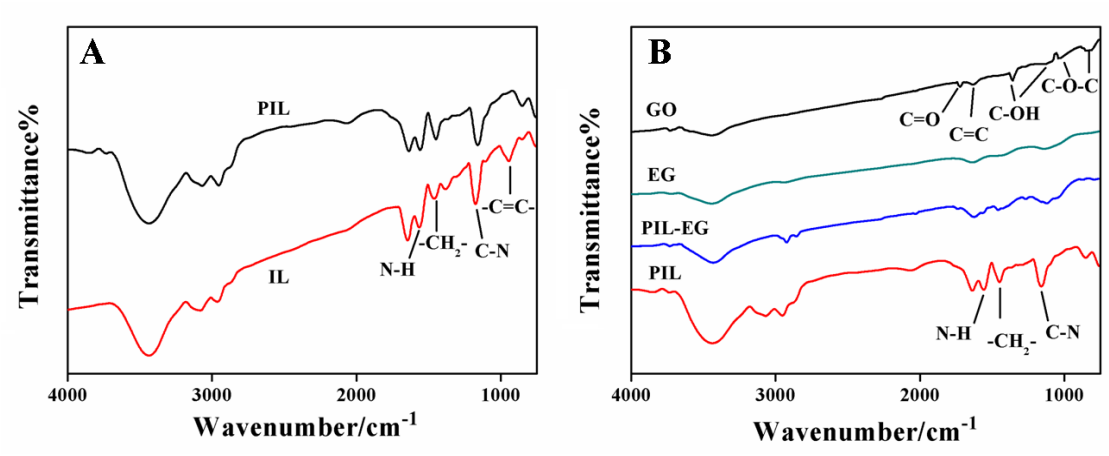

Fig.S2. FT-IR spectra of (A) PIL and IL; (B) GO, EG, PIL-EG and PIL

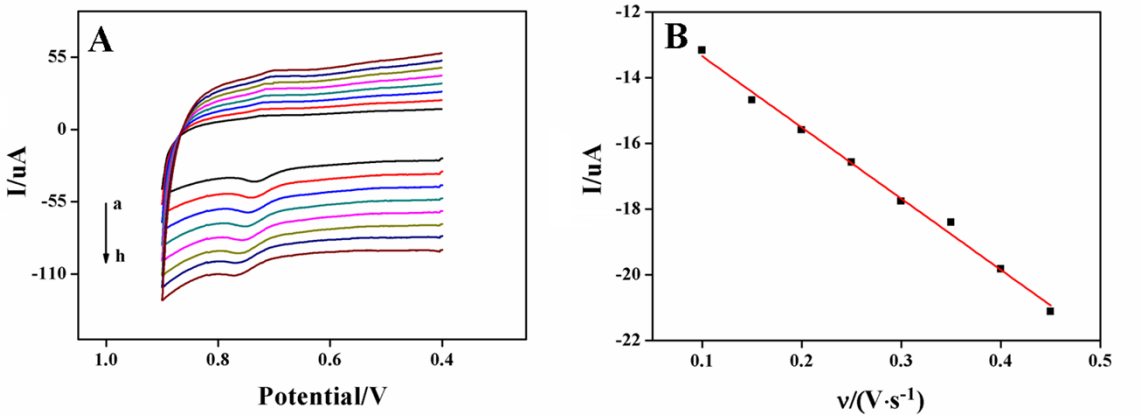

Fig.S3. (A) Cyclic voltammograms of PIL-EG/GCE at different scan rates (from inner to outer: 0.10, 0.15, 0.20, 0.25, 0.30, 0.35, 0.40 and 0.45V/s) the solution of 0.2mol/L PBS(pH 4.0) containing 2×10^{-4}mol/L Sudan I. (B) The dependence of oxidation peak currents on the scan rates.

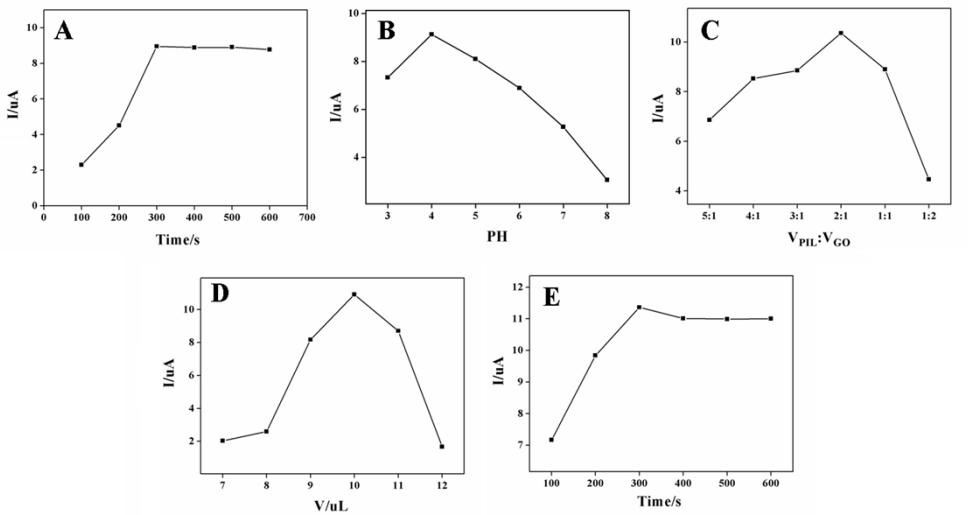

Fig.S4. Effects of accumulation time (A), buffer solution pH (B), different mass ratios (5:1, 4:1, 3:1, 2:1, 1:1, 1:2) between PIL and GO (C), amount of PIL-GO (D) and electrochemical reduction time (E) on the cyclic voltammetry responses in the presence of Sudan I (2×10^{-4} mol/L) and 0.2 mol/L PBS (pH 4.0), Scan rate：0.10 V/s

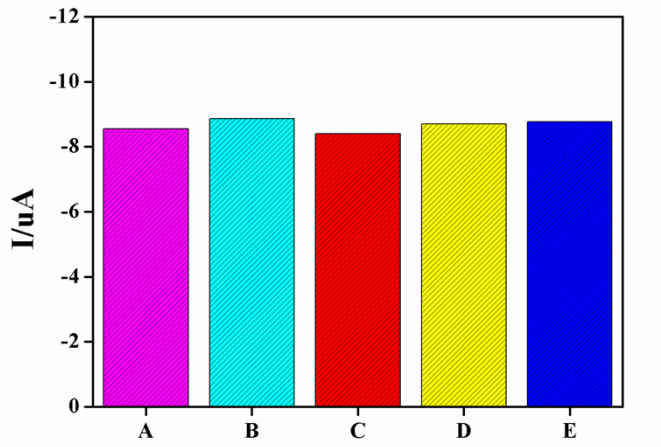

Fig.S5. Column graph of CV signals of recorded Sudan I at PIL-EG/GCE : (A) to (E) Column graph of CV signals of Sudan I (2×10^{-4} mol /L) in 0.2 mol/L PBS (pH 4.0) at five different electrode prepared under the same conditions.

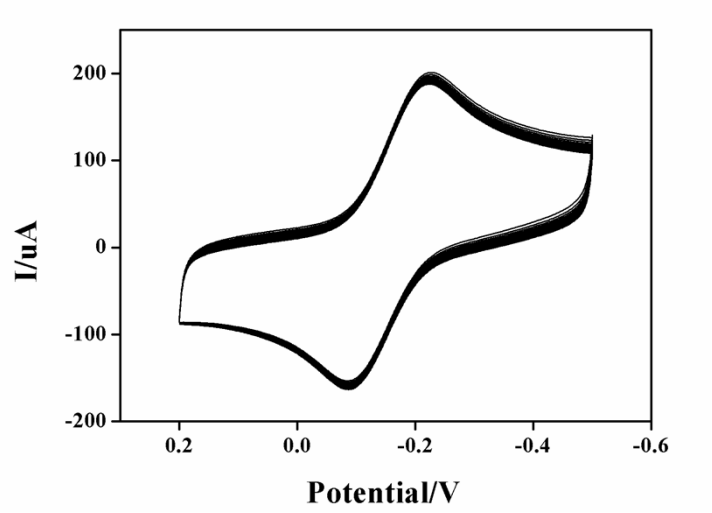

Fig.S6. 50 segments continuous CV scanning of PIL-EG/GCE in 10 mmol/L $Ru(NH_3)_6^{3+}$ solution with 0.1 mol/L KCl. Scan rate：0.05 V/s

Table.S1. Comparison of the detection of Sudan I with other sensors.

Electrode	Technique	Linear range ($\mu mol\cdot L^{-1}$)	LOD ($\mu mol\cdot L^{-1}$)	References
MWCNT/GCE	Amperometry	1.0–122	0.03	[1]
Activated glassy carbon electrode	LSV	2.4–18	0.71	[2]
Polyvinylpyrrolidone/CPE	LSV	0.2–8	0.01	[3]
Montmorillonite calcium/CPE	SWV	0.2–4.0	0.08	[4]
Ionic liquid-MWNT/GCE	LSV	0.05–2	0.03	[5]
Grapheme/GCE	CV	0.075–7.5	0.04	[6]
PIL-EG/GCE	Amperometry	0.0689–8.79	0.023	This work

Table S2. Detection results of Sudan I samples by two kinds of methods.

Method	Sudan I samples ($\mu mol \cdot L^{-1}$)	Expected ($\mu mol \cdot L^{-1}$)	Found ($\mu mol \cdot L^{-1}$)	Recovery(%)	RSD(%)
HPLC	0.08	0.08	0.0794	99.2	2.03
	0.40	0.40	0.395	98.7	1.11
	2.00	2.00	0.203	101.7	1.23
Amperometry	0.08	0.08	0.0782	97.8	1.41
	0.40	0.40	0.408	102.1	2.18
	2.00	2.00	1.98	98.9	1.87

References

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