

7,7,8,8-tetracyanoquinodimethane-assisted one-step electrochemical exfoliation of graphite and its performance as an electrode material

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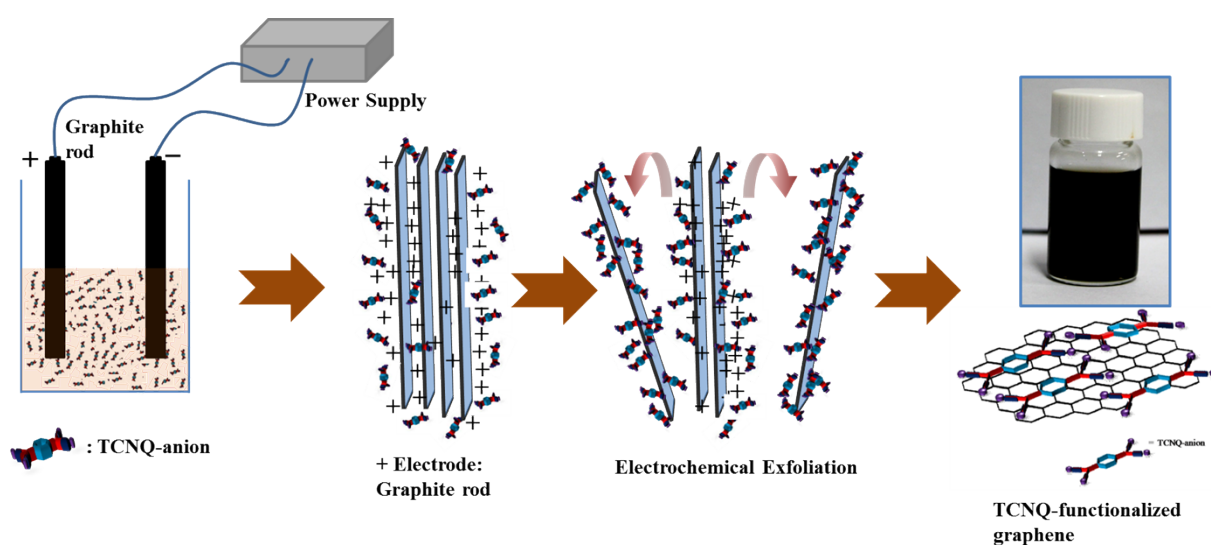


Fig. S1. Schematic diagram of electrochemical exfoliation of graphite in presence of TCNQ-anion aqueous electrolyte.

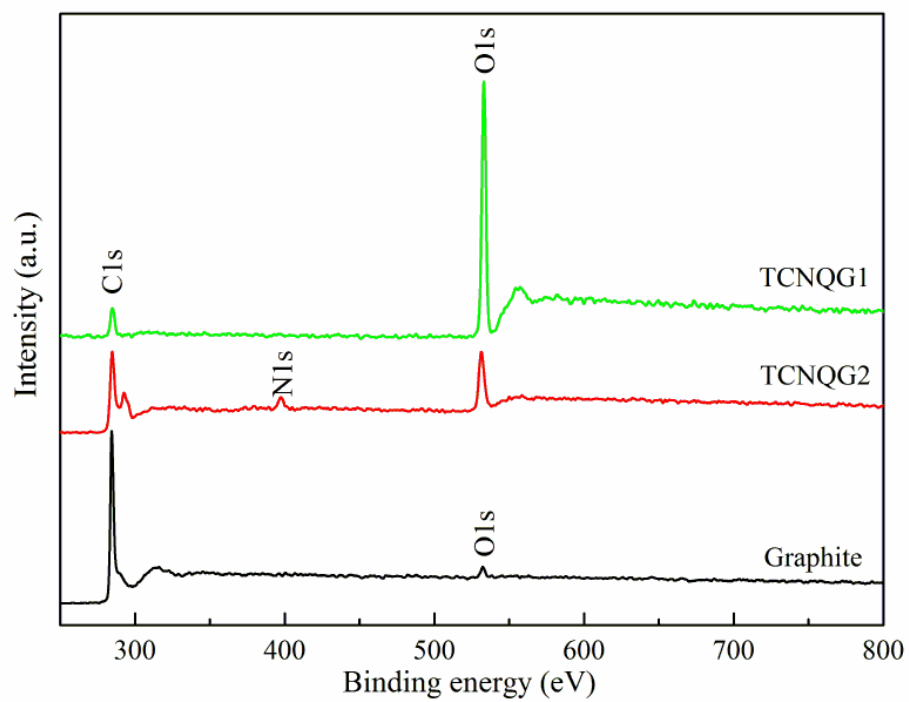


Fig. S2 XPS survey spectra of graphite, TCNQG1 and TCNQG2

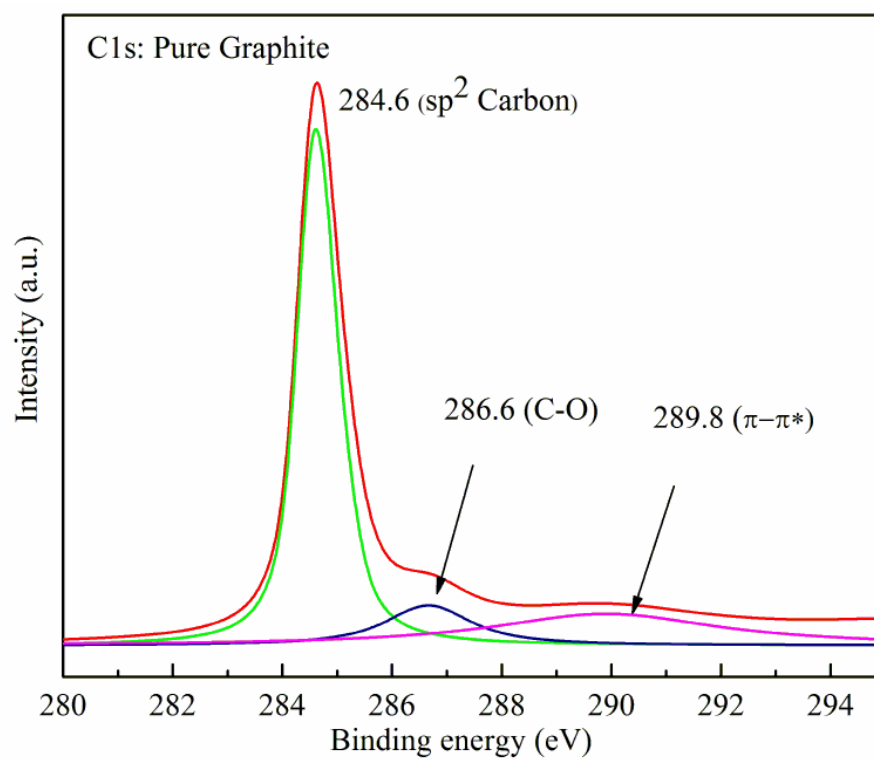


Fig. S1 Deconvoluted C1s spectra of pure graphite

Table S1 Comparison of materials preparation and electrochemical performance of TCNQ functionalized graphene sheets with the existing state-of-the-art compounds

Methods of preparation	Modifying agents	Exfoliation time (h)	Capacitance value (F g ⁻¹)	Cyclic stability (%)	Energy (Wh kg ⁻¹)/power density (W kg ⁻¹)	Reference
Sonochemical	9-anthracene carboxylic acid	24	148 in 1M H ₂ SO ₄	Not reported	Not Reported	1
Chemical	PEI & CNT	-	120 in 1M H ₂ SO ₄	Not reported	Not reported	2
Chemical	tert-butylhydroquinone	48	302 in 1M H ₂ SO ₄	94 after 800 cycle	Not reported	3
Chemical	CuO	14	331.9 in 6M KOH	95.1 after 1000	Not reported	4
Chemical	Goethite (α-FeOOH)	3	165.5	87 after 200 cycle	Not reported	5
Electrochemical	Sulfonated poly(ether-ether-ketone)	10-12	244 in 1M H ₂ SO ₄	10 th cycle	Not reported	6
Electrochemical	9-anthracene carboxylic acid	10	577 in 1M H ₂ SO ₄	83.4 after 1000 cycle	Not reported	7
Electrochemical	6-amino-4-hydroxy-2-naphthalene-sulfonic acid	12	115 in 1M H ₂ SO ₄	93 after 1000	Not reported	8
Present study	7,7,8,8-tetracyanoquinodimethane	12	324 in 1M KOH 140 in 1M Na ₂ SO ₄	76 in KOH and 87 in Na ₂ SO ₄ after 3000 cycle	86.9 /300 in KOH and 24.72 / 499.95 in Na ₂ SO ₄	

Reference

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