

Electronic Supplementary Information

A new approach to the reduced graphite oxide with tetrathiafulvalene in the presence of metal ions

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Contents

- 1. Cyclic voltammograms of GO, TTF and compounds 1 and 2.....S2**
- 2. Microscope images of exfoliated graphite oxide (GO).....S2**
- 3. Absorption spectra of TTF and GO in the presence of different metal ions.....S2-S4**
- 4. ESR spectrum of TTF and GO in the presence of Pb²⁺S5**
- 5. Absorption spectra of the ensemble of compound 1 and GO in the presence of Sc³⁺S5**
- 6. ESR spectrum of compound 1 and GO in the presence of Sc³⁺S5**
- 7. Raman spectra of GO and RGO.....S6**
- 8. Temperature-dependent conductivity of RGO.....S6-S7**
- 9. IR spectra of GO and RGO used KSCN as internal standard.....S8**

1. Cyclic voltammograms of GO, TTF and compounds 1 and 2

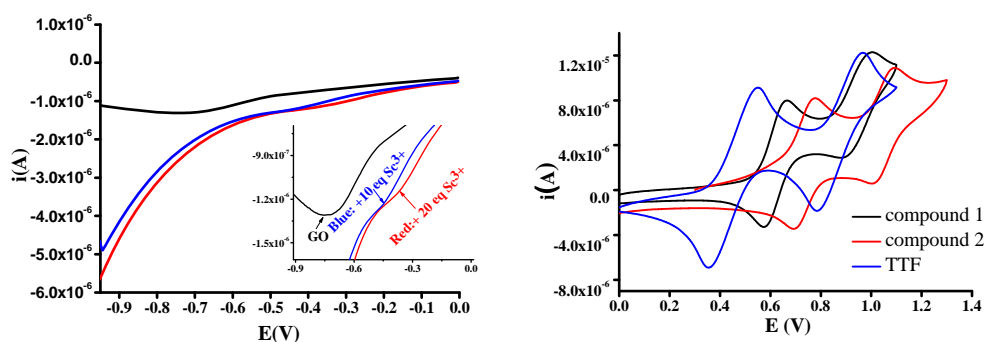


Figure S1. (a) The reduction potential of graphite oxide measured with differential pulse voltammetry in the absence and presence of Sc^{3+} ; (b) Cyclic voltammograms of TTF and compounds 1 and 2 in the mixture of CH_2Cl_2 and DMF (100:1, v:v); Electrochemical measurements were performed in a standard three-electrode cell, with glassy carbon as the working electrode and platinum wire as the counter electrode, and Ag/AgCl electrode (saturated KCl) as the reference electrode, $n\text{-Bu}_4\text{NPF}_6$ (0.1 M) was used as supporting electrolyte.

2. Microscope images of exfoliated graphite oxide (GO)

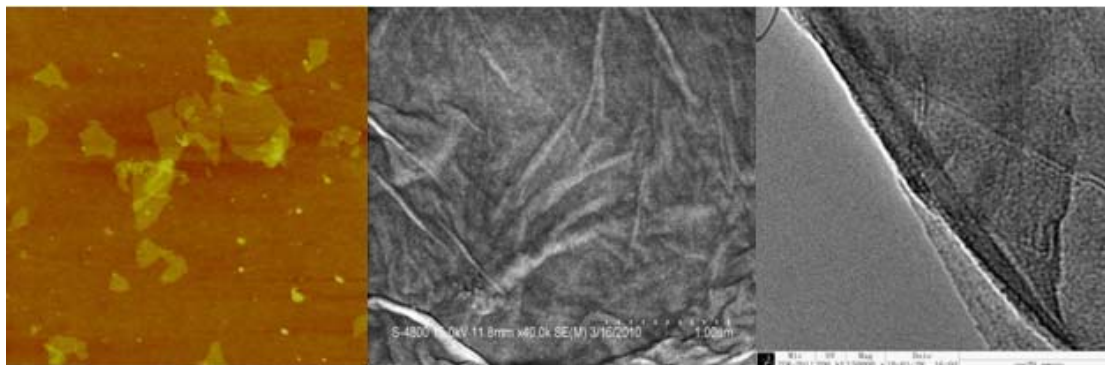
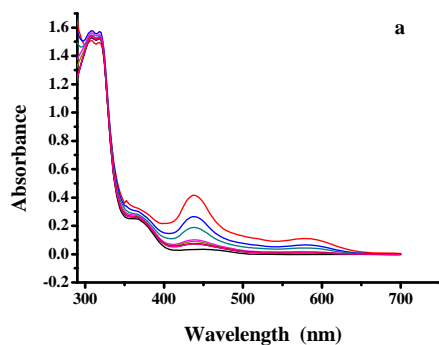
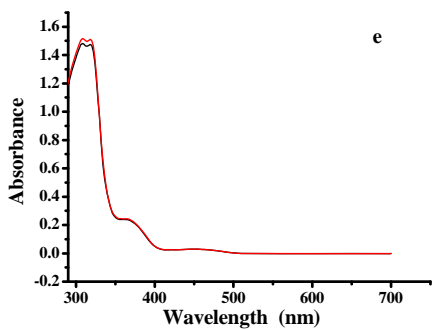
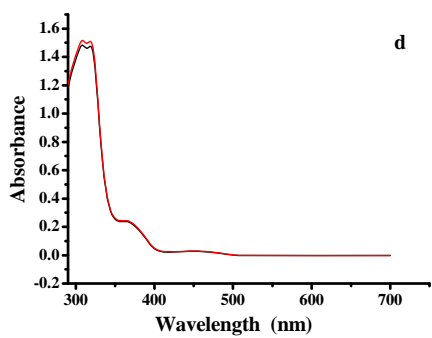
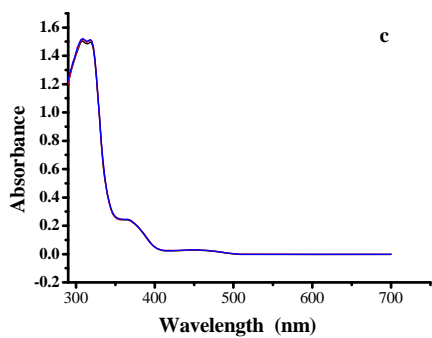
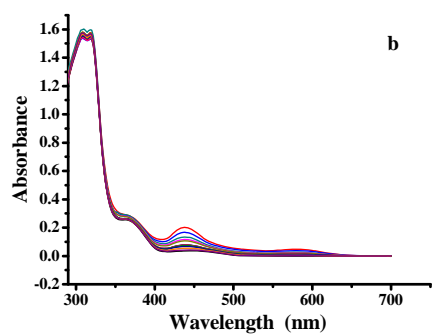


Figure S2. Tapping mode AFM (left), SEM (middle), TEM (right) images of exfoliated graphite oxide.

3. Absorption spectra of TTF and GO in the presence of different metal ions





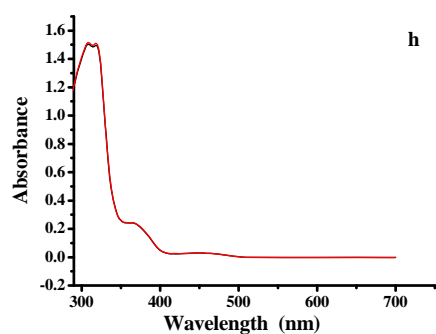
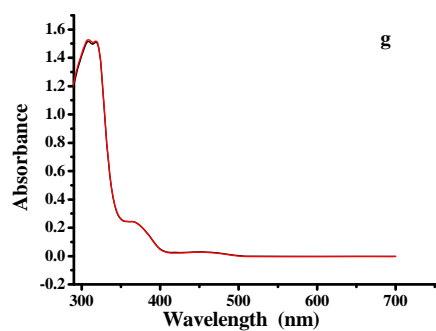
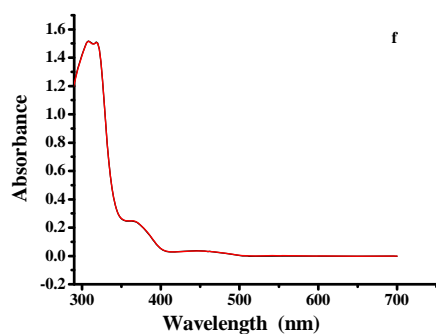


Figure S3. The absorption spectra of TTF (1.0×10^{-5} M) and GO (0.02 mg/mL) in the mixture of CH₂Cl₂ and DMF (100:1, v:v) after addition of different amounts of Pb²⁺ (a), Zn²⁺ (b), Na⁺ (c), K⁺ (d), Cs⁺ (e), Mg²⁺ (f), Ca²⁺ (g), and Ba²⁺ (h), respectively; the absorptions due to GO were subtracted in each case.

4. ESR spectrum of TTF and GO in the presence of Pb^{2+}

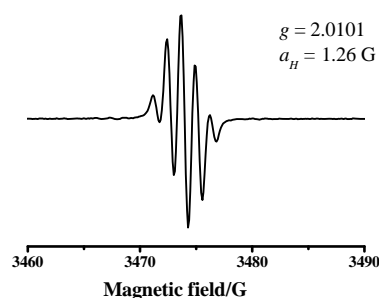


Figure S4. ESR spectra of TTF ($1.0 \times 10^{-5} \text{ M}$) and GO (0.02 mg/mL) in the mixture of CH_2Cl_2 and DMF (100:1, v:v) in the presence of 5.0 equiv of Pb^{2+} ; the spectrum was recorded at room temperature, and the solution was degassed before measurement.

5. Absorption spectra of the ensemble of compound 1 and GO in the presence of Sc^{3+}

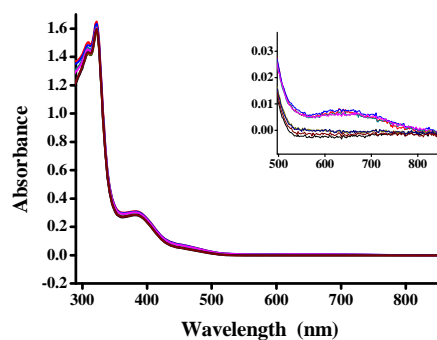


Figure S5 The absorption spectra of compound 1 ($1.0 \times 10^{-5} \text{ M}$) and GO (0.02 mg/mL) in the mixture of CH_2Cl_2 and DMF (100:1, v:v) after addition of different amounts of Sc^{3+} ; the absorptions due to GO were subtracted in each case; the inset shows the 500-800 nm part of the absorption spectra in the presence of increasing amounts of Sc^{3+} .

6. ESR spectrum of compound 1 and GO in the presence of Sc^{3+}

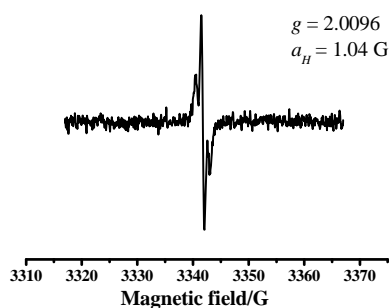


Figure. S6 ESR spectrum of compound 1 ($1.0 \times 10^{-5} \text{ M}$) and GO (0.02 mg/mL) in the mixture of CH_2Cl_2 and DMF (100:1, v:v) in the presence of 5.0 equiv of Sc^{3+} ; the spectrum was recorded at room temperature, and the solution was degassed before measurement.

7. Raman spectra of GO and RGO

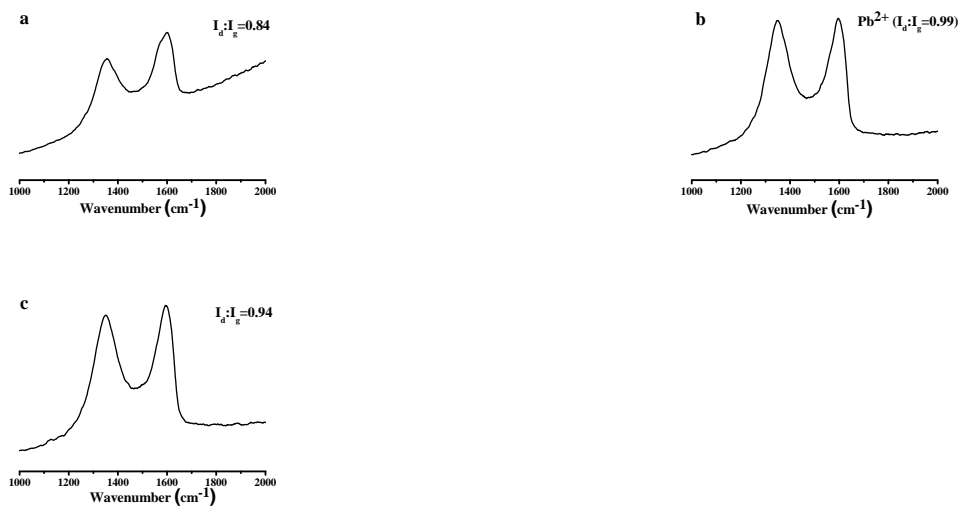


Figure S7 Raman spectra of GO before (a) and after reduction: (b) with TTF + Pb^{2+} , (c) compound **1** + Sc^{3+} .

8. Temperature-dependent conductivity of RGO

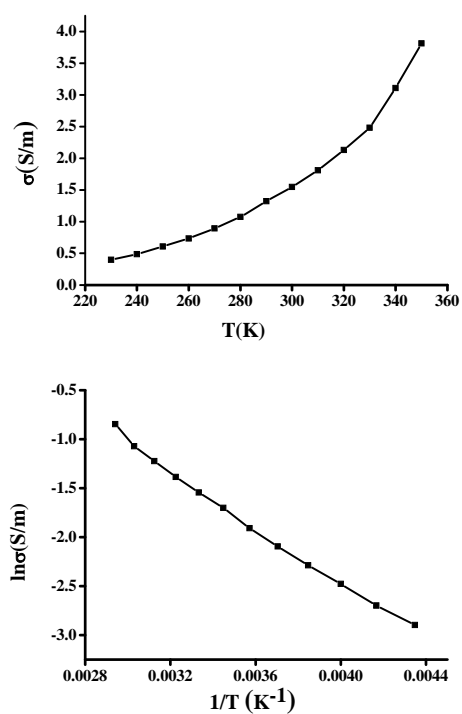


Figure S8 The variation of conductivity of RGO from the reduction of GO with TTF in the presence of Sc^{3+} vs. temperature.

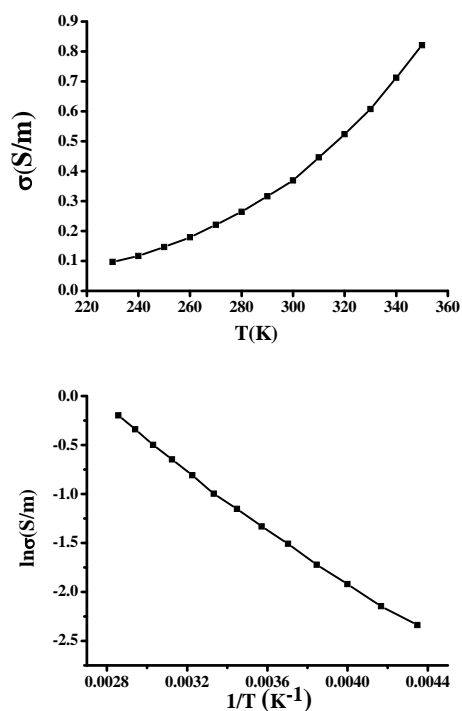


Figure S9 The variation of conductivity of RGO from the reduction of GO with TTF in the presence of Pb^{2+} vs. temperature.

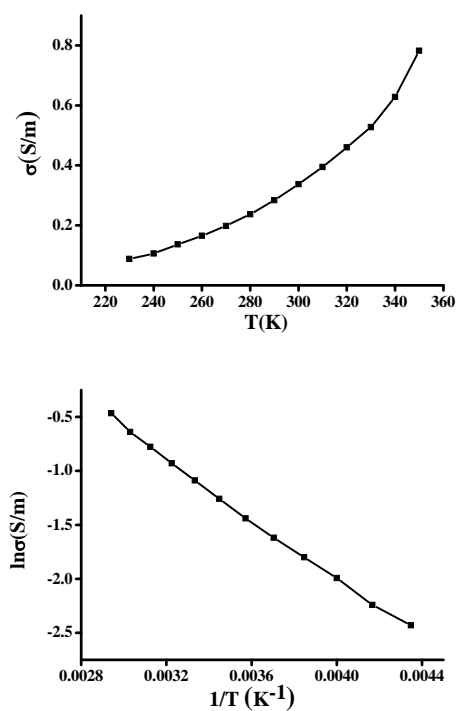


Figure S10 The variation of conductivity of RGO from the reduction of GO with compound **1** in the presence of Sc^{3+} vs. temperature.

9. IR spectra of GO and RGO used KSCN as internal standard

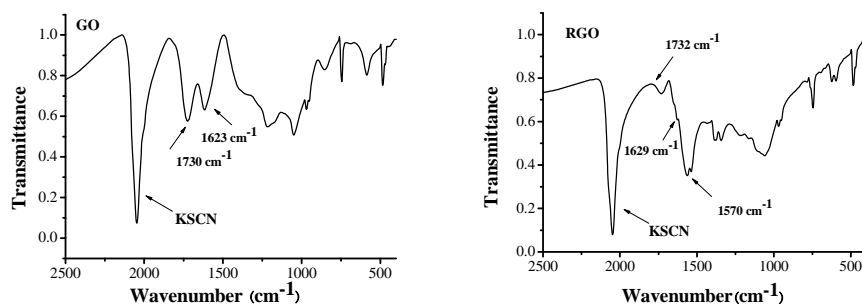


Figure S11 (*left*) IR spectrum of the compressed platelet of GO, KSCN and KBr; (*right*) IR spectrum of the compressed platelet of RGO, KSCN and KBr; for each case the same amount of KSCN, KBr and RGO/GO were used.