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ESI

Bio-inspired unprecedented synthesis of reduced graphene oxide: catalytic probe for electro-/chemical reduction of nitro group in aqueous medium

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1. **General Information:** All chemicals used in this study were analytical grade, commercially available and used without further purification. Graphite (CAS No.1E4011854, particle size: <100µm) was purchased from Sdfine. Most of the products were identified by FTIR, ^{1}H NMR and ^{13}C NMR. The progress of the catalytic reactions was monitored by TLC using silica gel. FT-IR spectra were recorded on a Thermo Nicolet, Avatar370 Spectrometer with resolution 4 cm^{-1} and Sample in KBr. The ^{1}H NMR and ^{13}C NMR spectra were recorded on a Bruker Advance III, 400 MHz instrument in CDCl3 or DMSO-*d6* solvents using TMS as internal standard. Chemical shifts were reported in ppm (δ) and coupling constants (*J*) in Hz. X-ray diffraction (XRD) analysis was conducted on a Bruker AXS D8 X-ray diffractometer with CuKα radiation(λ = 1.5406 Å). A transmission electron microscopy (JEOL 2100F) with an accelerating voltage 200 kV with a probe size under 0.5 nm to examine the morphology. The Scanning electron microscopy with EDAX images were obtained on VEGA 3 TESCAN, EDAX (Bruker) instrument. The absorbance of graphene oxide solutions was detected by UV-Vis Spectrophotometer.

2. The characteristic N=O *str.* at 1570-1500 cm^{-1} and 1370-1300cm^{-1} completely removed and a significant peak at 1278.42 cm^{-1} appeared for the C-N str.in primary aromatic amines, showed in FTIR spectrum of aniline

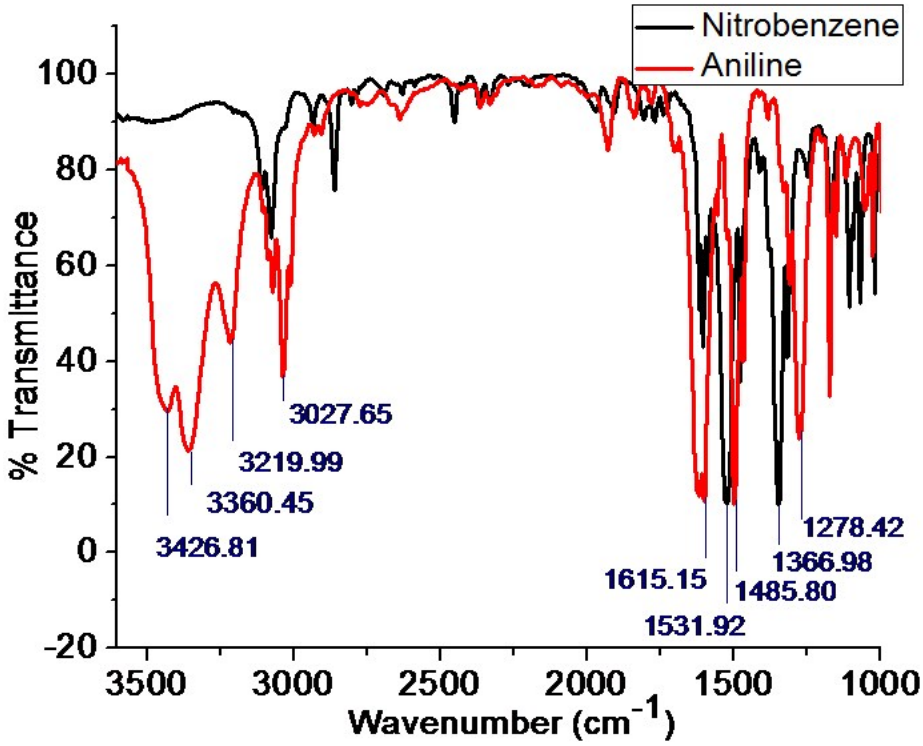

Fig. S 1: Comparison of FTIR spectra of nitrobenzene and aniline.

3. The ^{1}H NMR and ^{13}C NMR spectra were recorded on a Bruker Advance III, 400 MHz instrument in $CDCl_3$ or DMSO-*d6* solvents using TMS as internal standard. Chemical shifts were reported in ppm (δ) and coupling constants (*J*) in Hz. *Aniline*: pale brown liquid (94%), bp 184-185 ˚C. IR (KBr) ν_{max} 3426.81, 3360.45, 3027.65, 1615.15, 1485.80, 1278.42 cm^{-1}. ^{1}H NMR (400 MHz; $CDCl_3$/TMS): δ:

7.15 (dd, 2H $_{aromatic}$, J =7.2, 0.8 Hz) 6.75 (t, 1H $_{aromatic}$, J =7.6 Hz), 6.68 (d, 2H $_{aromatic}$, J =7.2, 0.8 Hz), 4.14 (s, 2H, N-H). ^{13}C NMR ($CDCl_3$/TMS) δ: 115.2, 118.6, 129.3, 146.4.

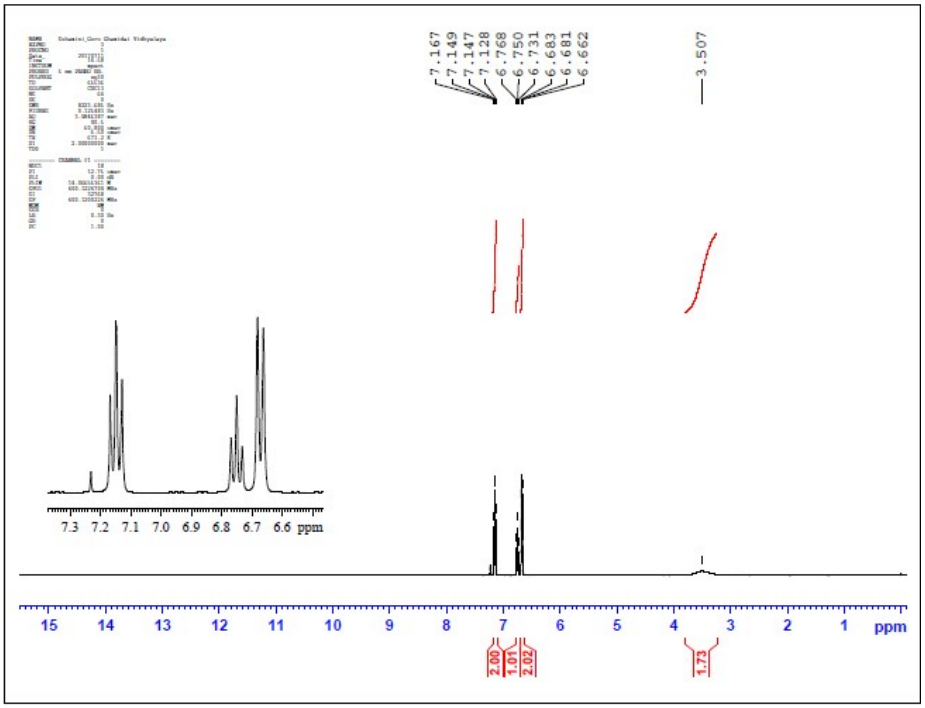

Fig. S 2: ^{1}H NMR spectrum of aniline

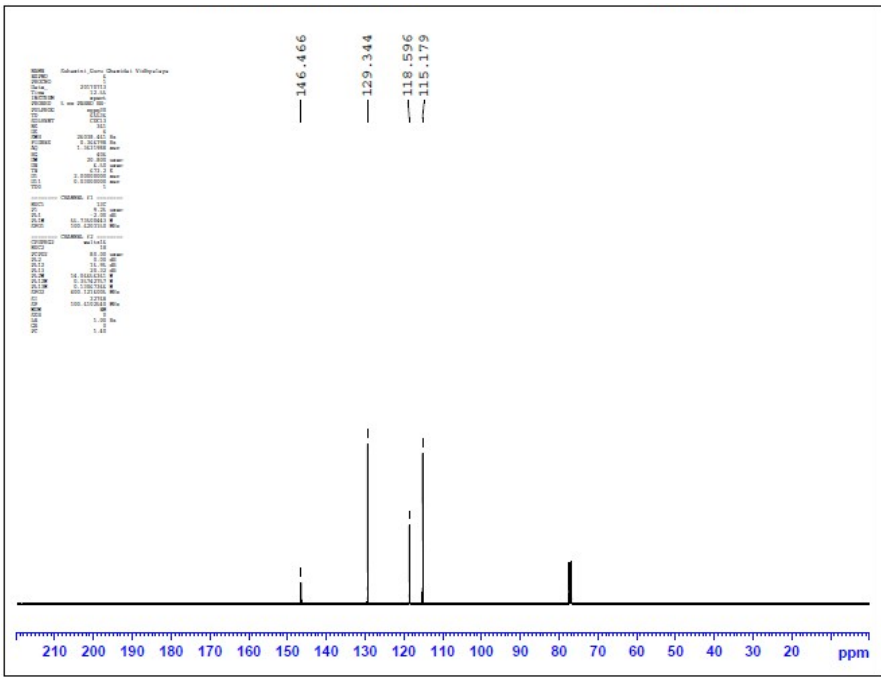

Fig. S 3: ^{13}C NMR spectrum of aniline