Supplementary Information

Covalent Modification and Exfoliation of Graphene Oxide using Ferrocene

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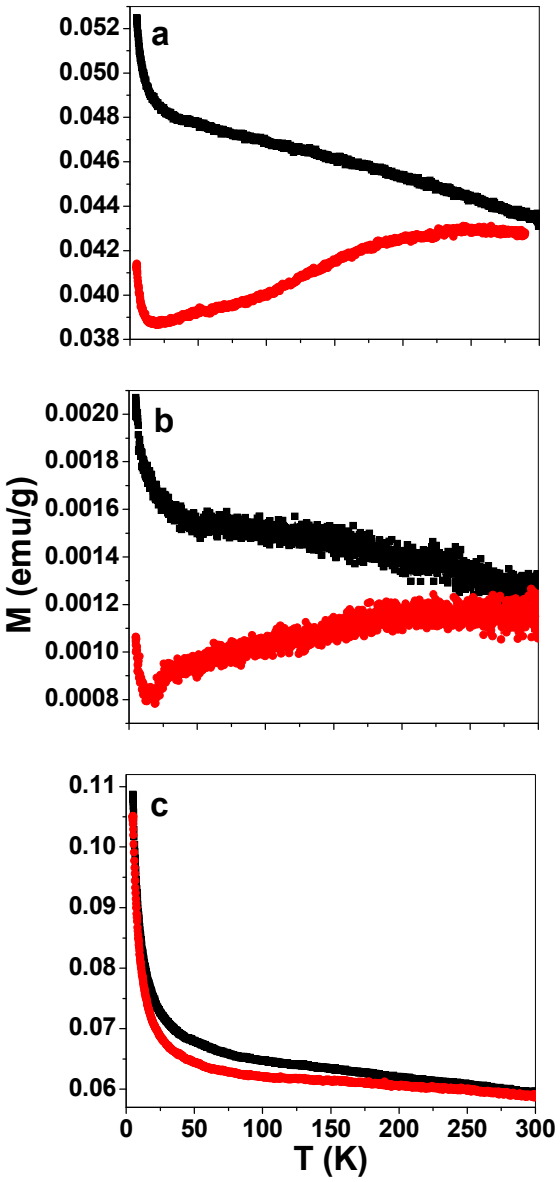

Fig. **S1** Temperature dependence of magnetization in a) graphene oxide (GO), b) ferrocene and c) ferrocene-graphene oxide (FGO) showing the field cooled (FC, black curve) and zero field cooled (ZFC, red curve) data measured at 500 Oe.

Table S1. Remnant magnetization (Mr) and coercive field (Hc) for GO, ferrocene and FGO measured at 5 K and 300 K.

Sample	**Mr (emu/g)**		**Hc (Oe)**	
	5 K	*300 K*	*5 K*	*300 K*
GO	0.030	0.013	265	100
Ferrocene	0.0013	0.0004	342	107
FGO	0.015	0.010	63	64

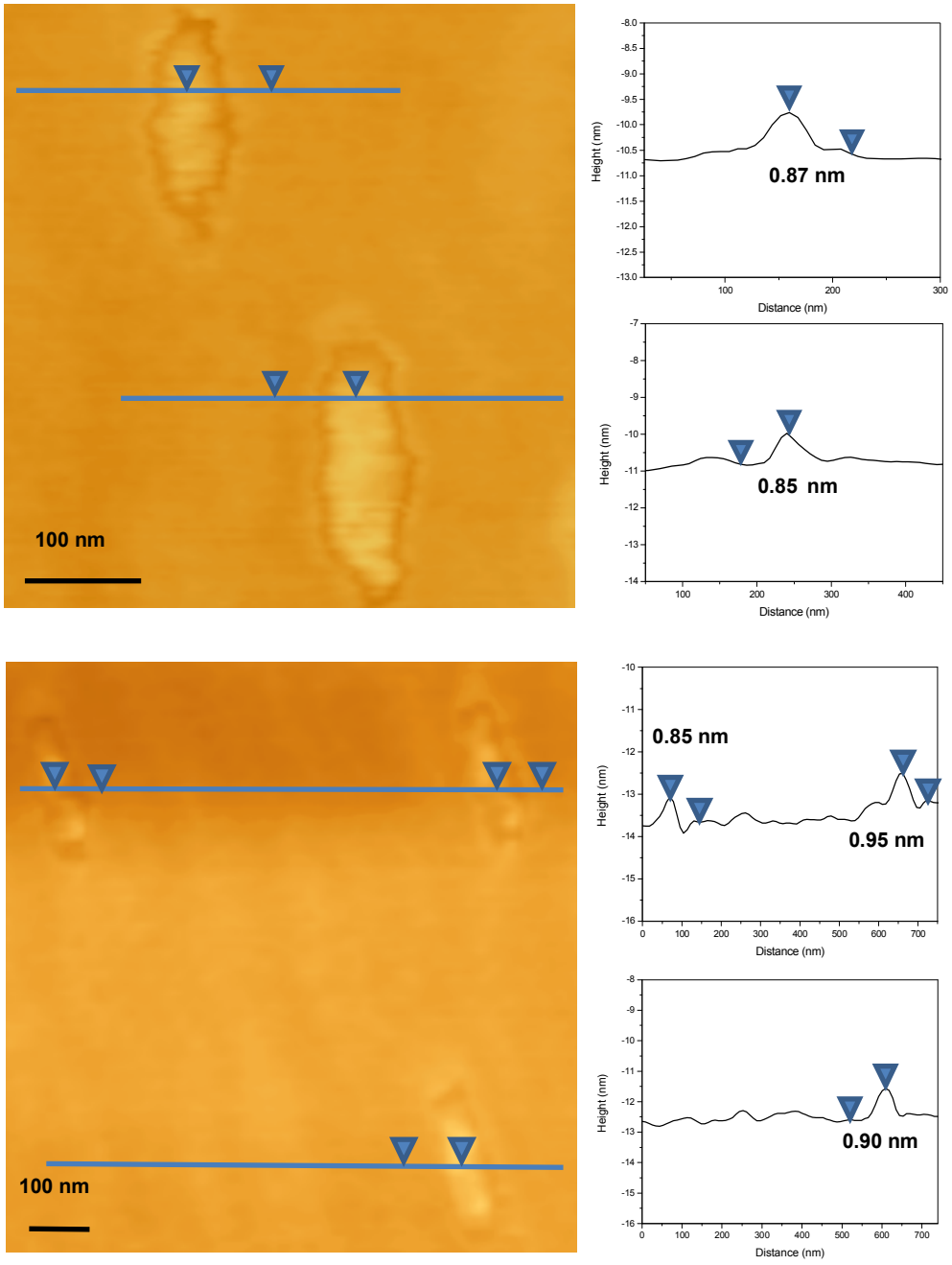

Fig. **S2** AFM images of single-layers of ferrocene-graphene oxide (FGO) with the corresponding height profiles.

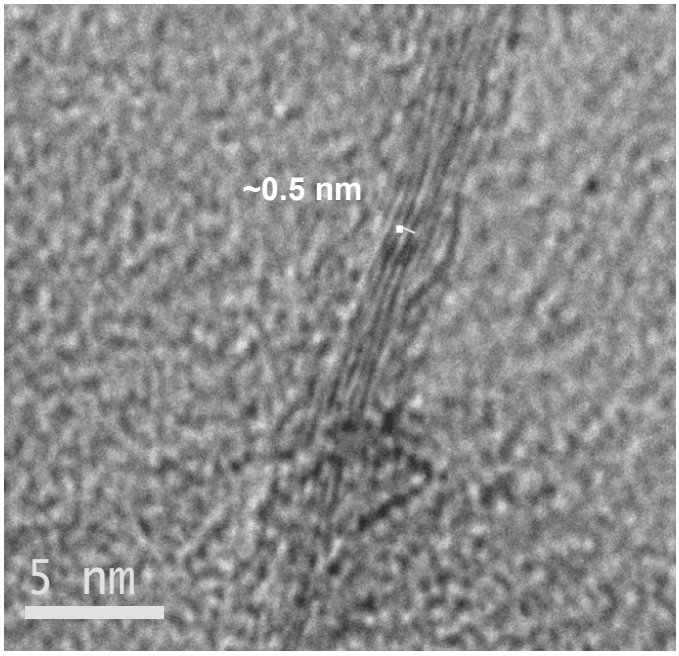

Fig. **S3** HRTEM micrograph of GO treated with ferrocene in the absence of solid phase acidic alumina and trifluoroacetic anhydride (interlayer spacing ~ 0.5 nm).

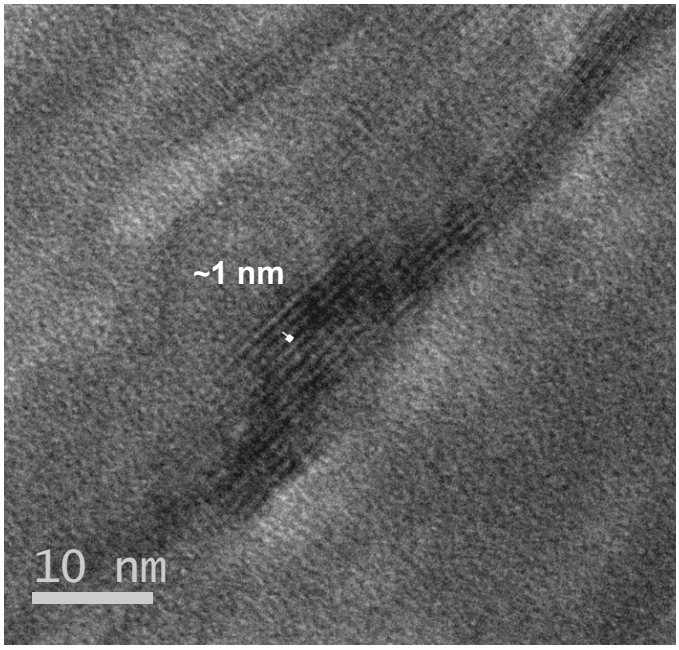

Fig. **S4** HRTEM micrograph of EG treated with ferrocene under Friedel-Craft reaction condition as described in the main text. (interlayer spacing ~ 1.0 nm)

Mössbauer Spectroscopy

The room temperature mössbauer spectra were recorded in transmission mode using ^{57}Co γ-ray source in a Rhodium matrix and multi-channel analyzer. The calibrations for velocity and isomer shift were performed using α-iron (Fe) foil. Mössbauer spectrum of FGO plotted with velocity along the x-axis and relative transmission of the γ-rays along y-axis (Fig. S5a). For comparative study, mössbauer spectrum of ferrocene was also recorded (Fig. S5b). The spectra were fitted to a doublet consisting of a pair of Lorentzians of equal full width at half maximum (FWHM) to obtain quadrupole splitting (QS, also Δ) and isomer shift (IS, also δ) values.

For ferrocene-graphene oxide (FGO) sample QS and IS of 0.81(2) mm s^{-1} and 0.57(3) mm s^{-1} were observed respectively (Fig. S5a). However ferrocene possesses QS and IS values of 2.37 mm s^{-1} and 0.53 mm s^{-1} respectively (Fig. S5b). The monoacylation of ferrocene in FGO introduces asymmetric chemical and electronic environment on cyclopentadienyl rings of ferrocene which is evident from the mössbauer spectrum of FGO.

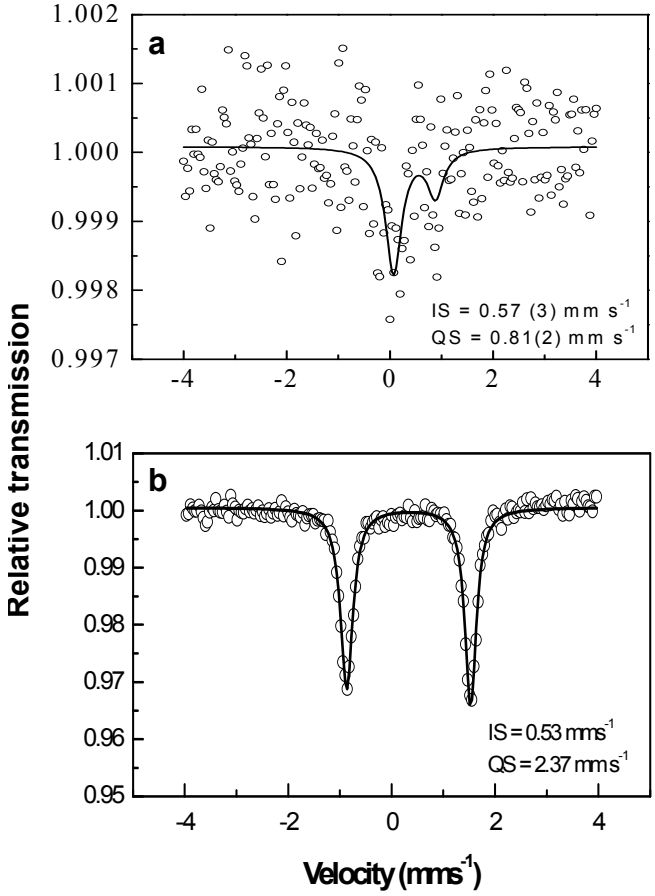

Fig. **S5** Mössbauer spectra of a) FGO and b) ferrocene