RSC Advances

ARTICLE

MnO_2 Nanowires Anchored on Amine Functionalized Graphite Nanosheets: Highly Active and Reusable Catalyst for Organic Oxidation Reactions

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Electronic Supplimentary Information (ESI)

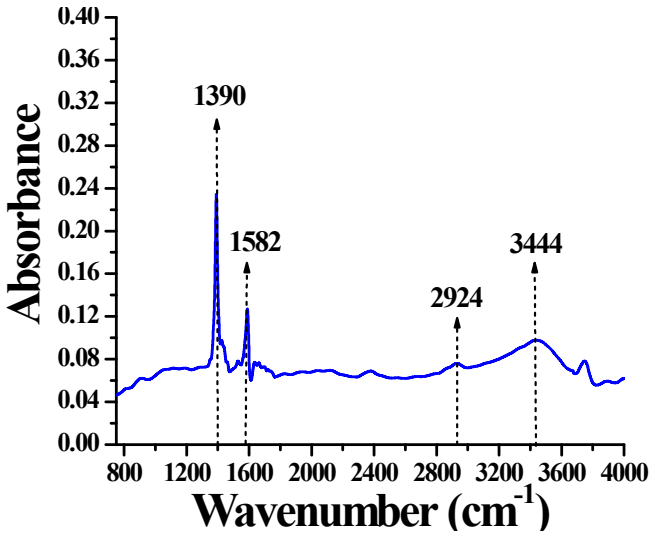

Fig. S1 FTIR spectrum of $–NO_2$ functionalized GNS showing the marking of the peaks in the body of the figure.

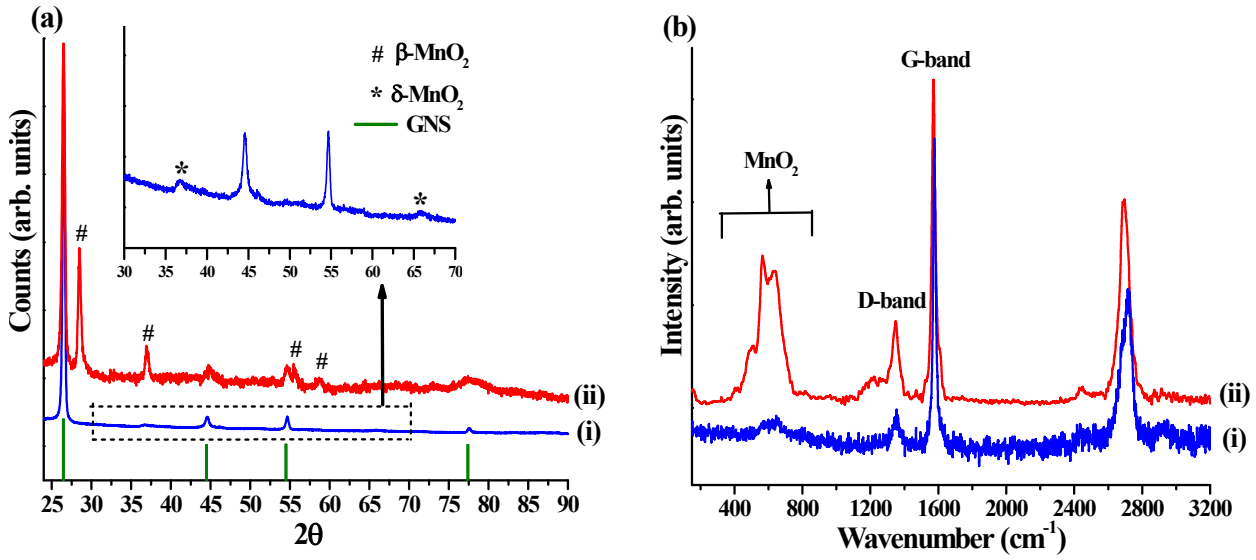

Fig. S2 (a) XRD pattern and (b) Raman spectrum of (i) the control reaction carried out with microcrystalline graphite and (ii) MnO_2@AFGNS. For better comparison the plot for MnO_2@AFGNS has been added in both the cases. Negligible peak of MnO_2 is visible in both the XRD pattern and Raman spectrum for the control reaction carried out with microcrystalline graphite.

Table S1 Oxidation of 4-methoxybenzyl alcohol using MnO_2@AFGNS catalyst with different loading of MnO_2.[a]

Entry	Catalyst	Temp. °C	Time (h)	Yield (%)[b]
1	MnO_2@AFGNS (3.1 wt%)	100	12	72
2	MnO_2@AFGNS (6 wt%)	100	12	83
3	MnO_2@AFGNS (7.6 wt%)	100	12	82

[a] 4–Methoxybenzyl alcohol (0.5 mmol), catalyst (0.035 mmol MnO_2), 1,4-dioxane (3 mL), reaction carried out under aerobic condition. [b] Isolated yield.

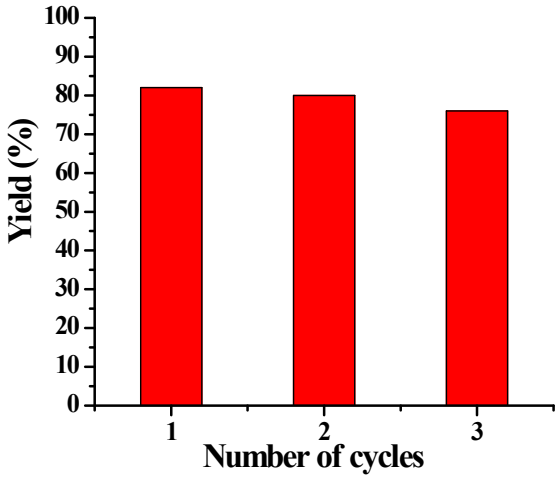

Fig. S3 Recyclability of MnO_2@AFGNS in 3 subsequent cycles on carrying out the reaction with 4–methoxybenzyl alcohol (0.5 mmol), MnO_2@AFGNS (40 mg; 0.035 mmol equivalent MnO_2) and 1,4–dioxane (3 mL) at 100 ^oC in open air.

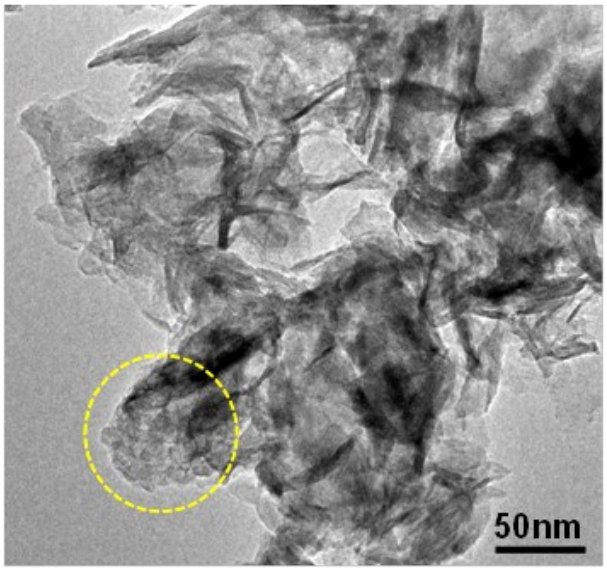

Fig. S4 TEM image of the MnO_2@AFGNS catalyst recovered after third catalytic cycle. The MnO_2 nanowires are visible in the image along with some agglomerated NP (encircled in body of image). This indicates that some deterioration in the structure of MnO_2 nanowires occurred during the course of reaction.