Electronic Supplementary Material (ESI) for New Journal of Chemistry.

Turn-on fluorescence sensing of hydrazine with MnO_2 nanotubes decorated g-C_3N_4 nanosheets

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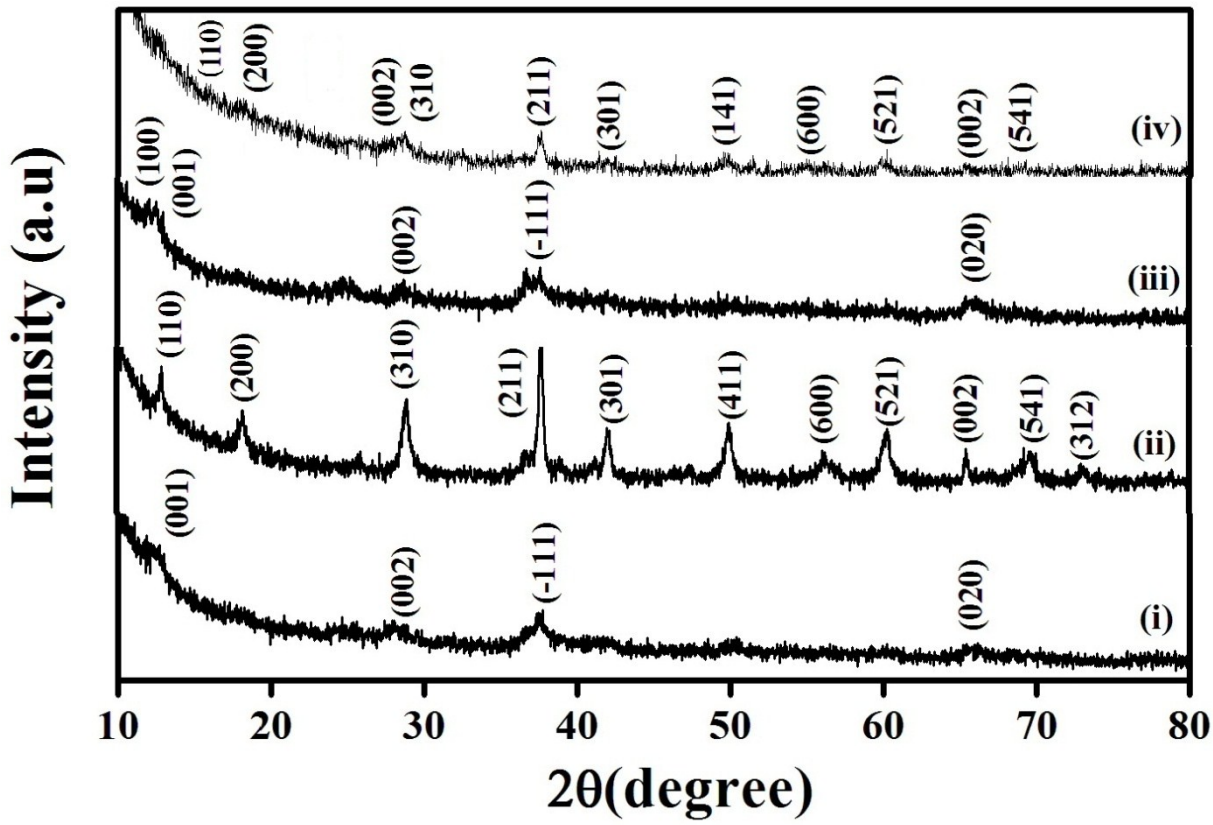

Fig. S1. XRD pattern of (i) MnO_2 nanoparticles, (ii) MnO_2 nanorods, (iii) g-C_3N_4-MnO_2 nanoparticles, and (iv) g-C_3N_4-MnO_2 nanorods.

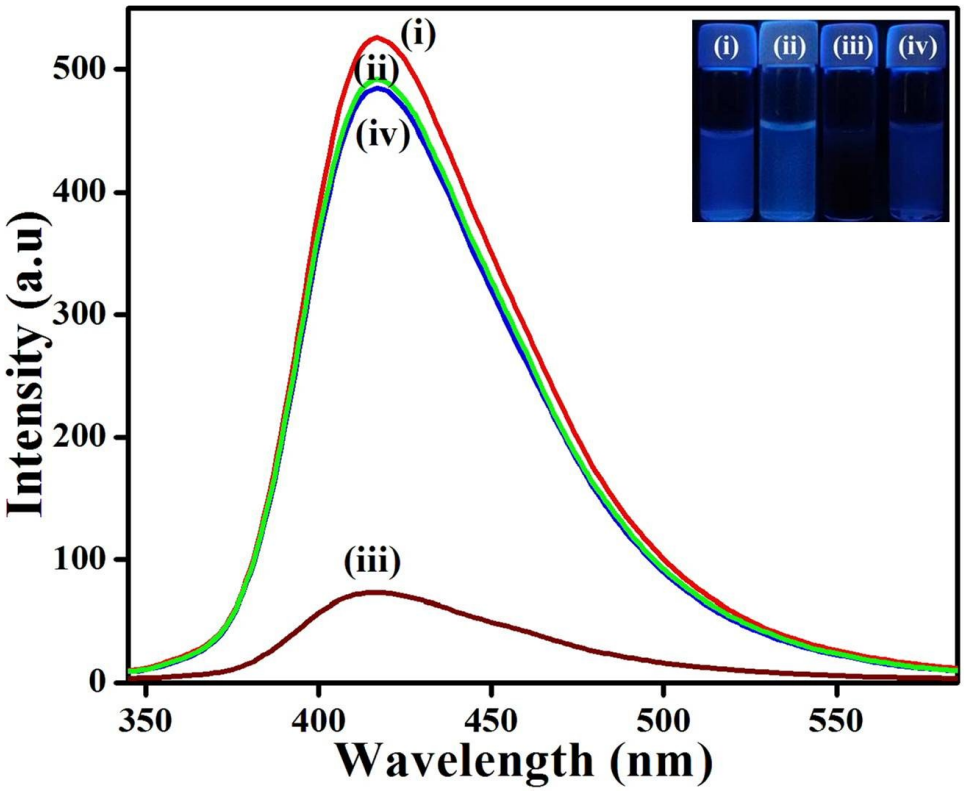

Fig. S2. Fluorescence emission spectra of g-C_3N_4 and its nanocomposites (Inset : Photograph of (i) g-C_3N_4, (ii) g-C_3N_4-hydrazine, (iii) g-C_3N_4-MnO_2, and (iv) g-C_3N_4-MnO_2-hydrazine under UV light (excitation wavelength - 365 nm).

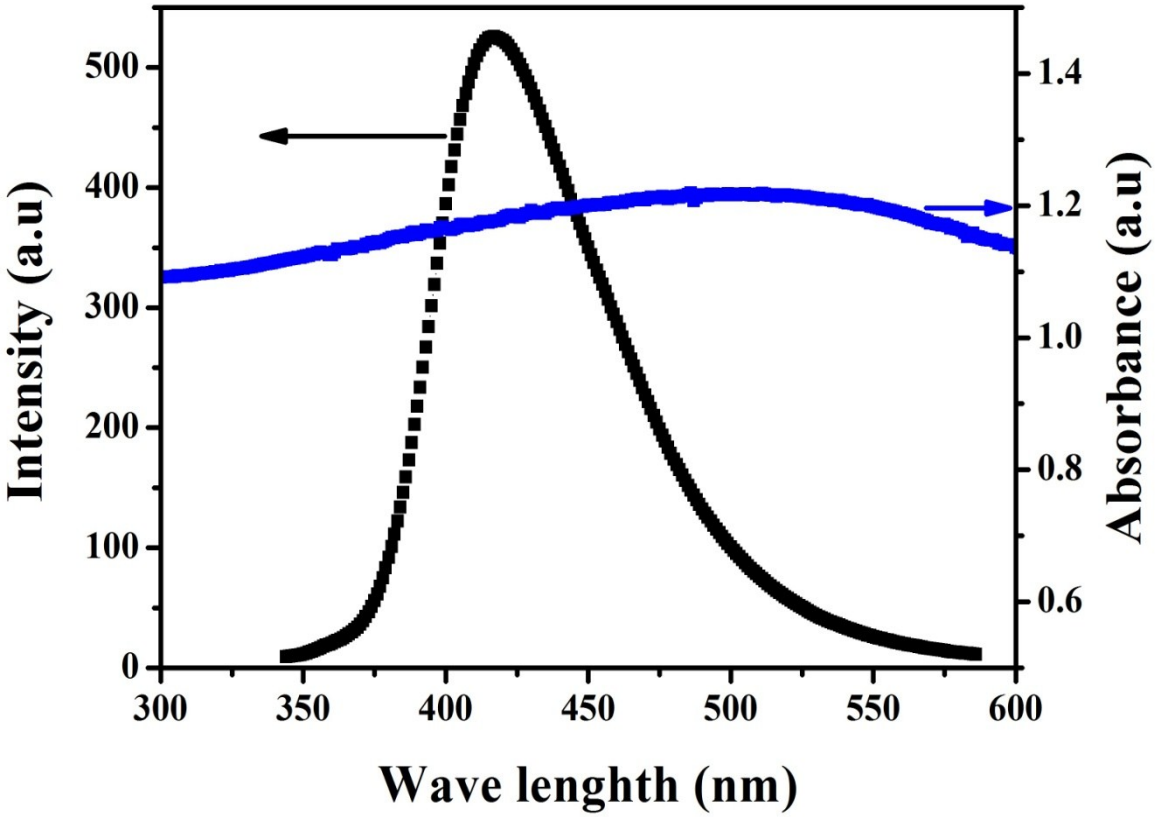

Fig. S3. Spectral overlap showing the UV-Vis absorption spectrum of MnO_2 nanotubes and the fluorescence emission spectrum of the g-C_3N_4 nanosheets.

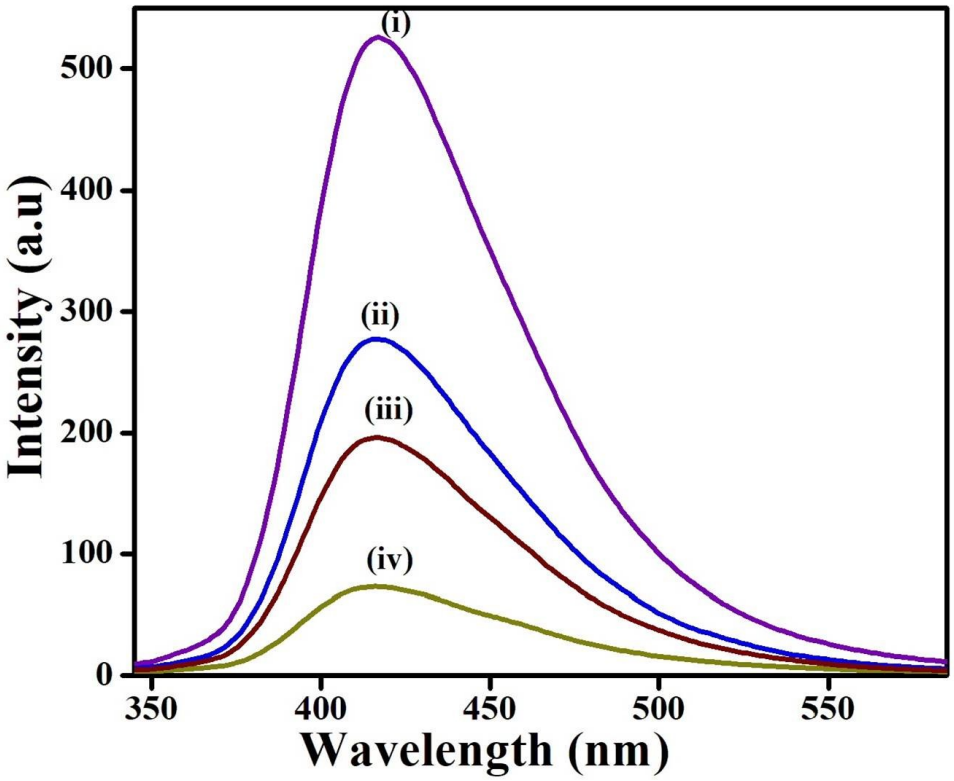

Fig. S4. Fluorescence emission spectra of (i) g-C_3N_4, (ii) g-C_3N_4-MnO_2 nanoparticles, (iii) g-C_3N_4-MnO_2 nanorods, and (iv) g-C_3N_4-MnO_2 nanotubes.

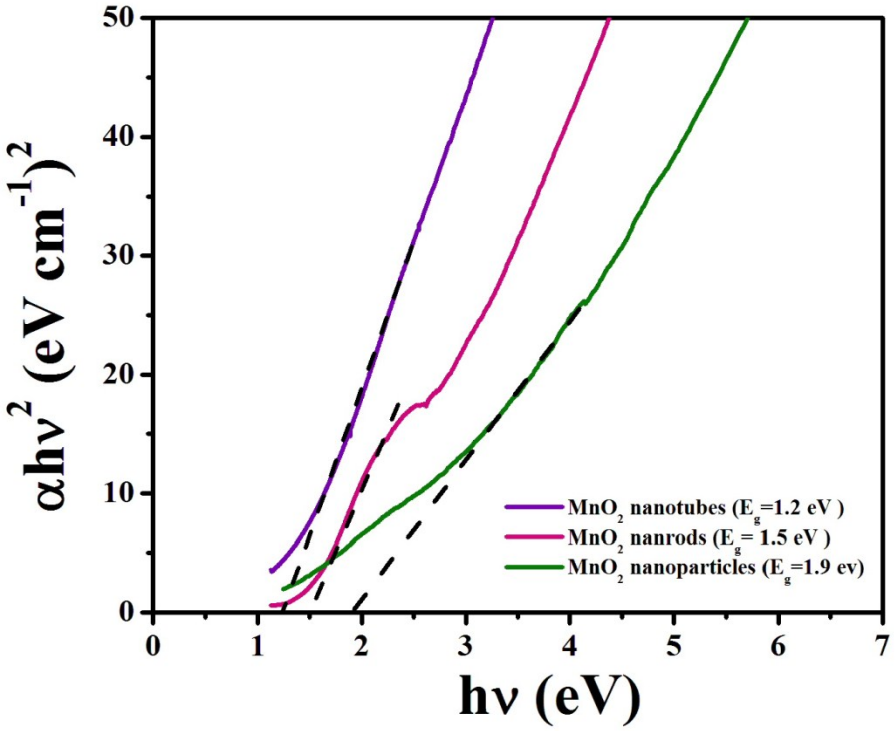

Fig. S5. Tauc plot for various MnO_2 nanostructures.

Table S1. Comparison of previously reported fluroscence probes for hydrazine detection with g-C_3N_4-MnO_2.

Probe	**Linear range (µM)**	**LOD[a] (µM)**	**Reference**
Bromo-ester derivative of flavone	0-40	0.15	[1]
HBT[b]	1-9.5	0.066	[2]
Pyrazoline derivative	10-20	0.0622	[3]
LC[c] derivative	0-14	2.46	[4]
TAPHP[d]	0-20	0.3	[5]
Naphthalimide derivative	1-30	0.27	[6]
Coumarin derivative	-	31	[7]
1,8-naphthalimide derivatives	150-3200	46.2	[8]
7-(diethylamino)-2-oxo-2H-chromen-4-carbaldehyde	0-1	0.022	[9]
BP[e]	0.06-0.12	0.0034	[10]
CyJ[f]	0-50	0.17	[11]
CF[g]	0.1-1.0	0.1	[12]
DPI[h]	0-100	0.188	[13]
BPB[i]	-	1.87	[14]
g-C_3N_4[j] -MnO_2	**2-55**	**0.12**	**This work**

[a]limit of detection; [b]2-(2'-hydroxyphenyl) benzothiazole; [c]levulinated coumarin; [d]3-[4-(Di-p-tolyl-amino)-phenyl]-1-(2-hydroxy-phenyl)-propenone; [e]2-(4-((4-benzo[d]thiazol-2-yl)phenyl)ethynyl)benzylidene); [f]hemicyanine derivatives; [g](4-phtalamide-N-(4'-methylcoumarin) naphthalimide); [h]2-((5-imethylamino)naphthalen-1-yl)sulfonyl)isoindoline-1,3-dione; [i]boron-pyrromethene-based pyrenebutyrate-linked chromogenic; [j]graphitic carbon nitride nanosheets;

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