

Supporting Information

Insoluble Dendrimer Grafted Poly(vinylimidazole) Microbeads Stabilized with Mono/bimetallic nanoparticle as catalysts for Effective Degradation of Malachite Green

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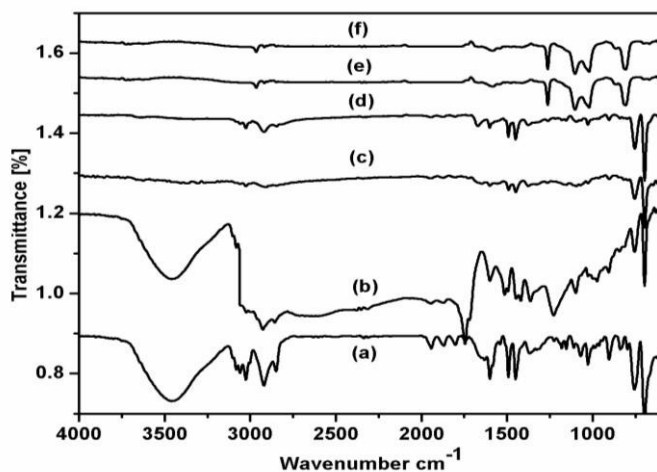


Figure S1. FT-IR spectra of HC (a) PVIIm (b) PVIIm-COOH (c) PVIIm-D(G2) (d) PVIIm-D(G3) (e) PVIIm-D(G2)-AuNPs (f) PVIIm-DG(3)-AuNPs

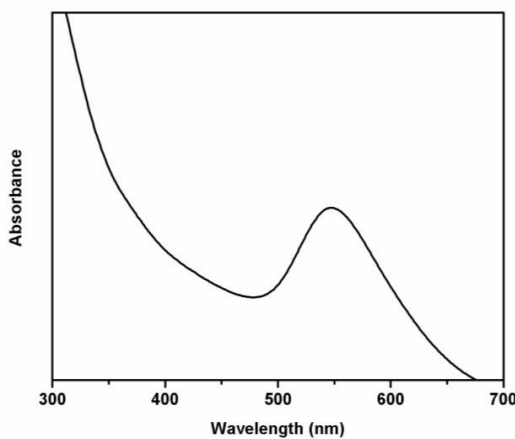


Figure S2. UV-Visible spectrum of LC-PVIIm-D(G3)-AuNPs

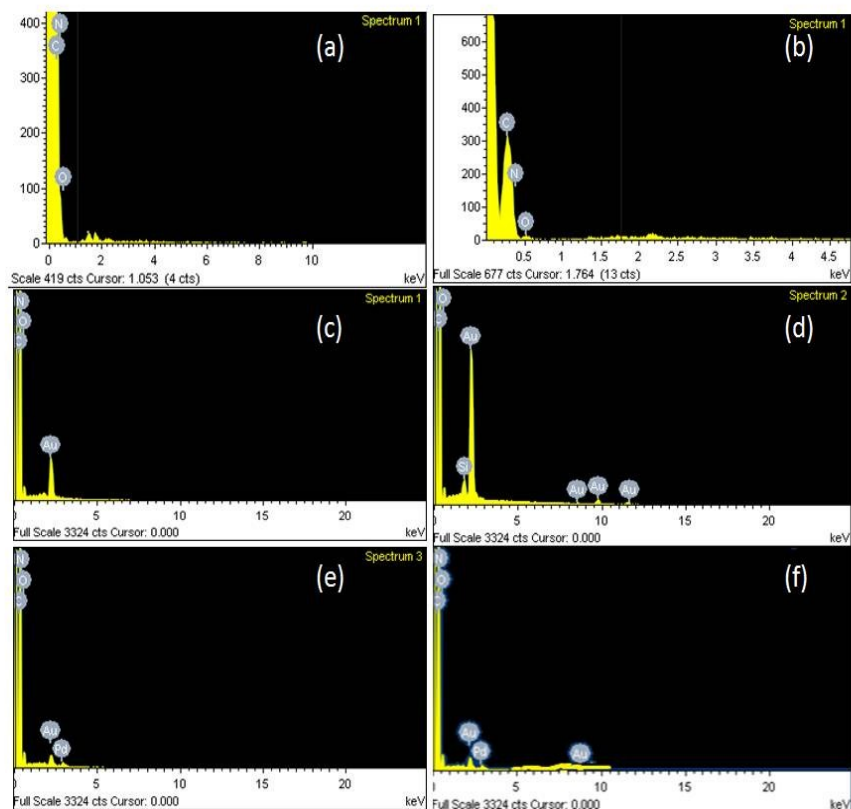


Figure S3. EDAX spectra of (a) LC-PVIm-D(G2) (b) LC-PVIm-D(G3) (c) LC-PVIm-D(G2)-AuNPs (d) LC-PVIm-D(G3)-AuNPs (e) LC-PVIm-D(G2)-AuPdNPs (f) LC-PVIm-D(G3)-AuPdNPs.

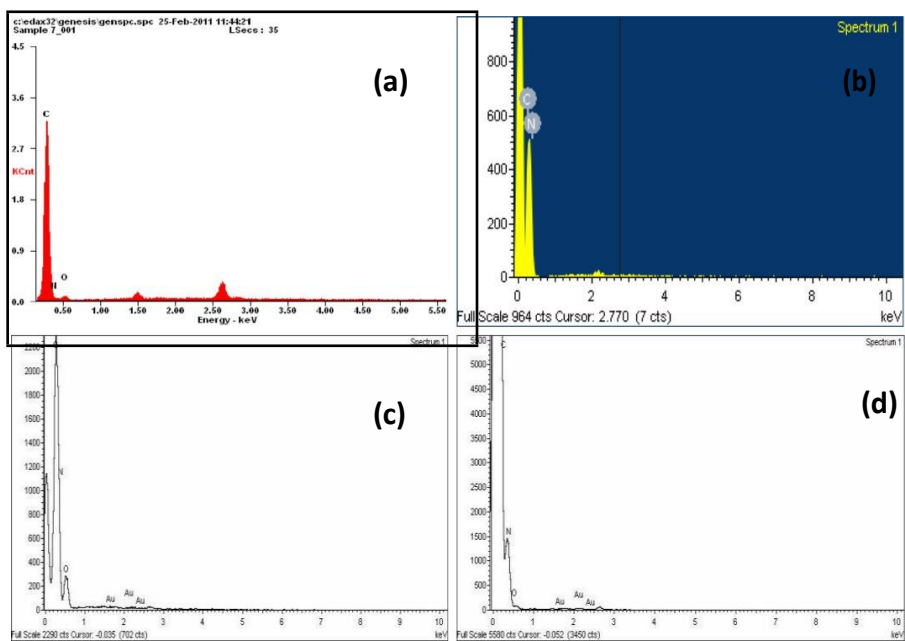


Figure S4. EDAX spectra of (a) HCVIm-D(G2) (b) HC-PVIm-D(G3) (c) HC-PVIm-D(G2)-AuNPs (d) HC-PVIm-D(G3)-AuNPs.

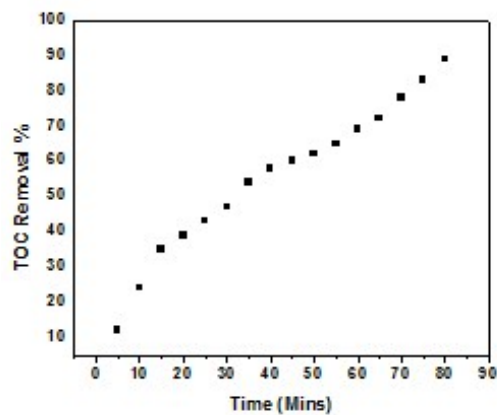


Figure S5. Variation of TOC Removal (%) obtained from TOC analysis

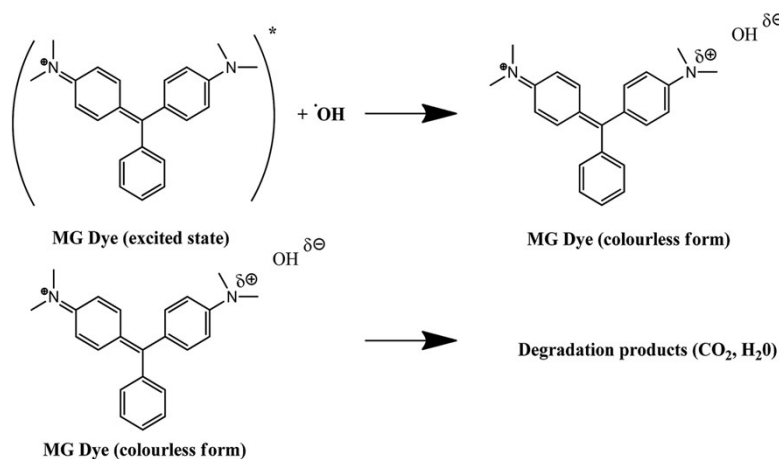


Figure S6. Mechanism for degradation of Malachite green

Table S1. Comparative catalytic efficiency of all the six types of bead-shaped heterogeneous nanoparticle catalysts derived from LC and HC-PVIm matrices for the reduction of Malachite green.

Name of the catalysts	$k_{\text{obs}} 10^3(\text{min})$
LC-PVIm-D(G2)-AuNPs	11.35
HC-PVIm-D(G2)-AuNPs	5.62
LC-PVIm-D(G3)-AuNPs	23.48
HC-PVIm-D(G3)-AuNPs	8.23
LC-PVIm-D(G2)-AuPdNPs	27.50
LC-PVIm-D(G3)-AuPdNPs	36.61

Table S2. List of main intermediates from the degradation of malachite green in the presence of superior catalyst detected by GC-MS

m/z ratio (mins)	Name of the Intermediate	Retention time
329	Malachite Green	9.23
315	Desmethyl- Malachite Green	8.16
331	Leuco Malachite Green	9.32
317	Desmethyl- Leuco Malachite Green	6.87
226.12	(Dimethylamino-phenyl)-phenyl methanone	6.56
120	N,N-Dimethylaniline	6.08
105.62	Benzaldehyde	6.34
77.85	Benzene	5.72