

Size controlled Silver Nanoparticles on β -cyclodextrin/Graphitic Carbon Nitride:

An excellent nanohybrid material for SERS and Catalysis Applications

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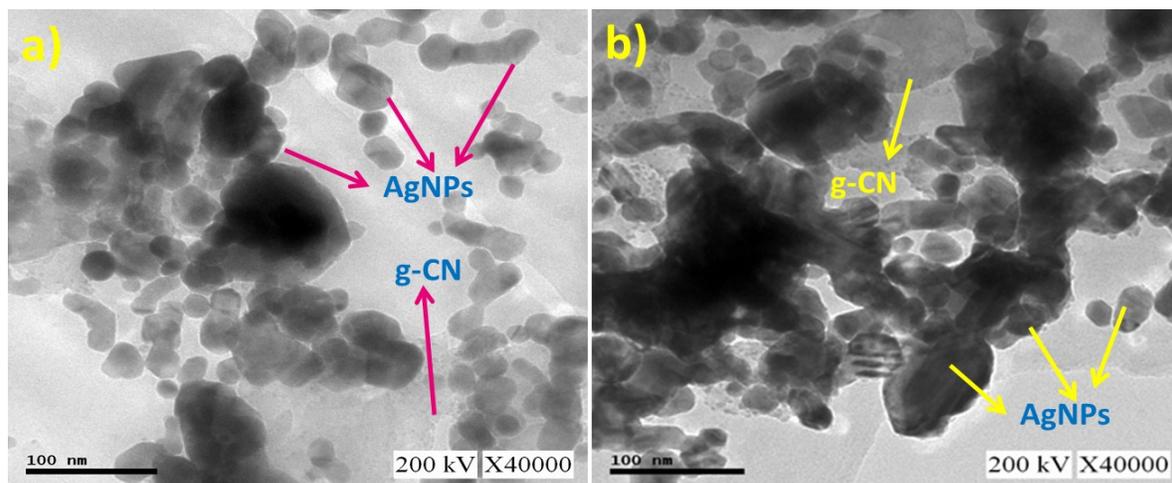


Fig. S1. a and b HRTEM images of AgNPs/g-CN (various parts)

Raman peaks for MG (cm ⁻¹)	SERS peaks for MG (cm ⁻¹)	Vibrational Peak Assignments
1616	1618	N-Ph ring + C-C str
1597	1595	In plane ring str + bend
1493	1493	NH ₂ bend
1425	1400	NH ₂ bend
1374	1374	CH ₂ bend
1355	1368	N-Ph ring str
1275	1298	Rocking of C-H
-	1174	In-plane C-H bending
871	-	C-H bend of benzene ring
772	-	NH ₂ bend. Torsion
733	735	In plane ph ring + NH ₂ str
532	532	In plane ph ring def
416	419	Out of plane ph ring def

Table. S1. Raman and SERS peak assignments for MG

Table. S2. AEF for SERS spectra of different concentrations of MG on AgNPs/ β -CD/g-CN-NH

AEF of MG on AgNPs/ β -CD/g-CN-NH				
S.No	-log[MG] M	SERS Peak Positions		
		1174 cm^{-1}	1400 cm^{-1}	1618 cm^{-1}
1	3	3.76×10^2	2.34×10^2	3.13×10^2
2	4	2.65×10^3	1.56×10^3	1.90×10^3
3	5	1.94×10^4	1.14×10^4	1.41×10^4
4	6	1.23×10^5	7.34×10^4	9.22×10^4
5	7	8.05×10^5	4.79×10^5	5.88×10^5
6	8	4.04×10^6	2.50×10^6	3.10×10^6
7	9	7.26×10^6	7.07×10^6	6.73×10^6

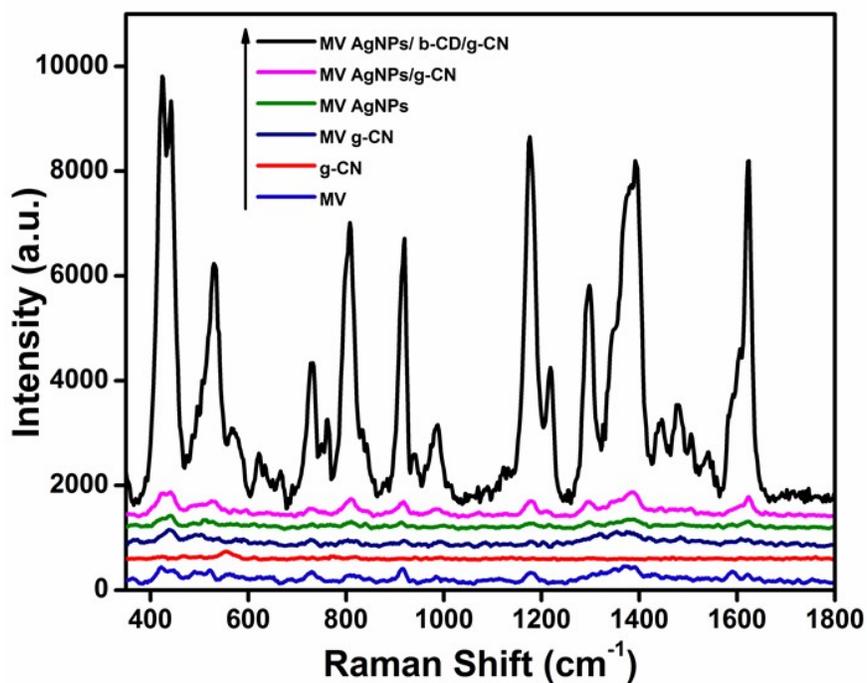


Fig S 2. MV-g-CN, MV-AgNPs, MV-AgNPs/g-CN and MV-AgNPs/ β -CD/g-CN (down to up) b) SERS sensing of MV in the concentration range between 1×10^{-3} to 1×10^{-7} M on AgNPs/ β -CD/g-CN, and c) Plot of intensity at 1174, 1400 and 1622 cm^{-1} vs $-\log[\text{MV}]$

Table. S3. Assignment of Raman and SERS peaks of MV

Raman peaks for MV (cm^{-1})	SERS peaks for MV (cm^{-1})	Vibrational Assignments
1622	1622	N-Ph ring + C-C str
1543	1543	In plane ring str
1501	1504	C-C-ring
1441	1446	C-C ring, CH_2 bend
1396	1400	C=N
1355	1368	N-Ph ring str, CH_2 bend
1215	1219	In plane C-H and C-C-H
-	1174	Ph ring bent vib
986	988	C-H bend of benzene ring
926	926	=CH bend
810	810	In plane ph ring
532	532	In plane ph ring def
422	422	Out of plane ph ring torsion vib

Table. S4. AEF for SERS spectra of different concentrations of MV on AgNPs/ β -CD/g-CN-NH

S.No	$-\log[\text{MV}] \text{ M}$	AEF of AgNPs/ β -CD/g-CN-NH
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		1174 cm ⁻¹	1400 cm ⁻¹	1622 cm ⁻¹
1	3	3.29×10^2	2.04×10^2	3.71×10^2
2	4	1.62×10^3	8.10×10^3	1.45×10^3
3	5	6.08×10^3	4.24×10^3	6.91×10^3
4	6	1.40×10^4	1.47×10^4	2.16×10^4
5	7	4.81×10^4	9.14×10^4	8.85×10^4

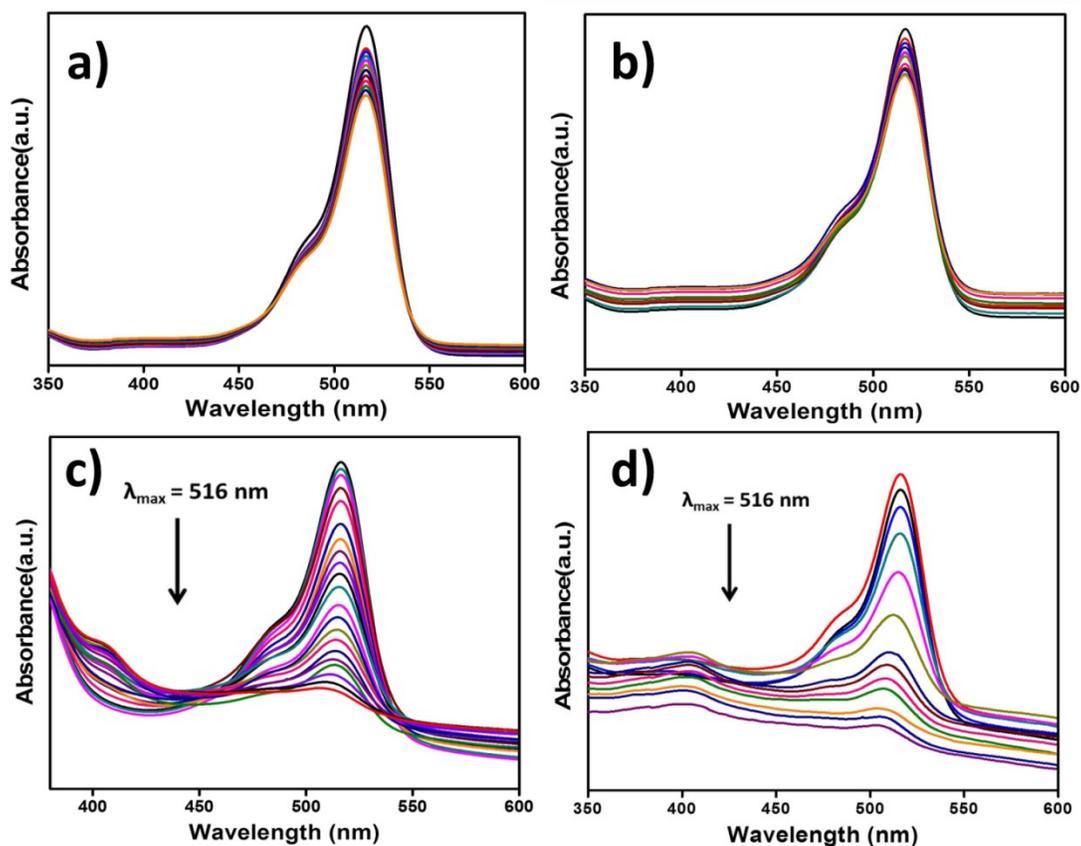


Fig 3 S. Catalytic activity of g-CN+NaBH₄, NaBH₄, AgNPs+NaBH₄ and AgNPs/g-CN+NaBH₄ for the reduction of EY

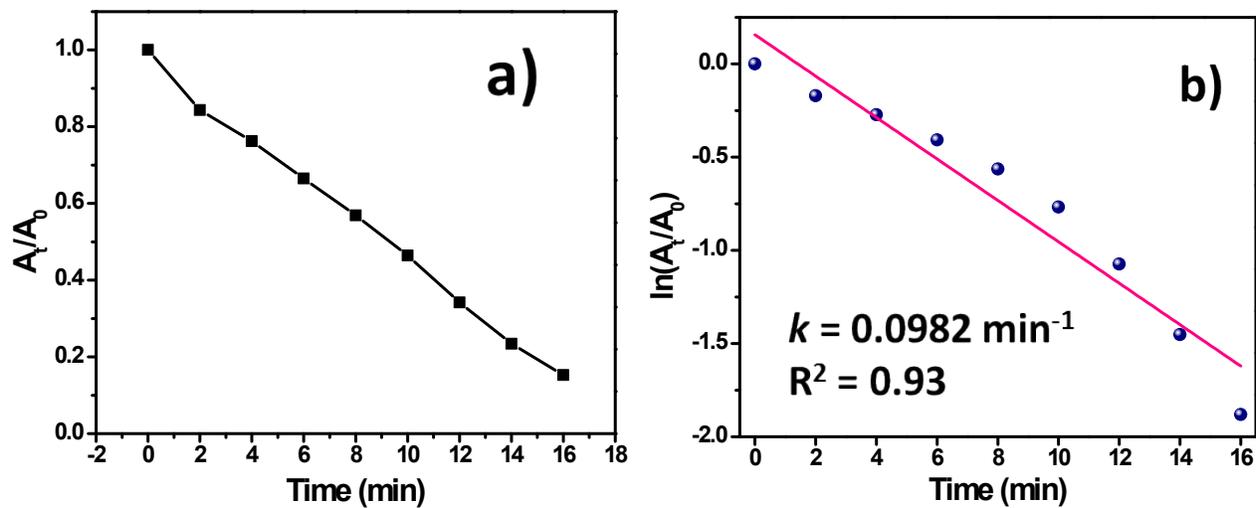


Fig 4 S a) Plot of A_t/A_0 vs Reaction Time (min) b) The kinetic plot of $\ln(A_t/A_0)$ vs Time (min) for the catalytic reduction of CR using AgNPs/ β -CD/g-CN-NH catalyst