

SUPPORTING INFORMATION

Beneficial Role of Gold Nanoparticles as Photoprotector of Magnesium tetraphenylporphyrin

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High-resolution C1s and N1s XPS spectra for gold nanoparticles (AuNPs) are shown in Fig.S1 and S2, respectively. The C1s region of AuNPs comprises three distinct peaks. The peak appearing at 285 eV, is assigned to C-C and C-H from tetraoctylammonium bromide (TOAB), the stabilizing agent used in the preparation of AuNPs. The second peak at 286.07 eV is ascribed to C-N of quaternary amine from TOAB, while a smaller peak at higher binding energy (287.17 eV) is probably due to an impurity.

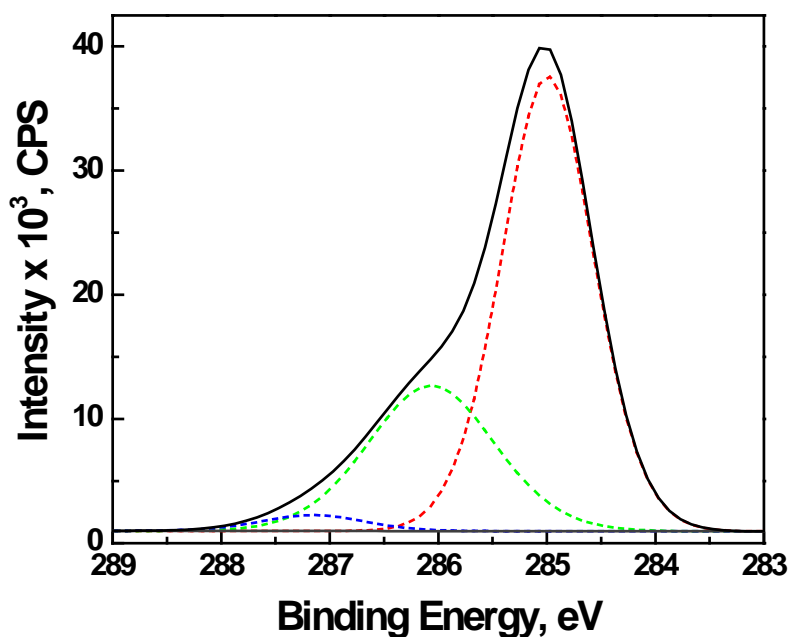


Fig. S1 C1s narrow scan XPS spectrum for AuNPs.

The N 1s spectrum of AuNPs (Fig. S2) presents two peaks with an intensity ratio of about 99:1, which appear at 401.34 (90.5%) and 402.96 eV (9.5%), respectively. Both peaks are characteristic of quaternary nitrogens, although, present in two different chemical environments. The first one at 401.34 eV is assigned to quaternary nitrogen (Oct_4N^+) of TOAB adsorbed on the surface of AuNPs.¹ The second peak, a weaker one, at high binding energy 402.96 eV, corresponds most probably to the small quantity of TOAB which is not in direct contact with gold surface of AuNPs, but rather through the intermediacy of bromide ions which are adsorbed on gold nanoparticles. This signal is consistent with the work of Bureau et al who reported the

presence of a similar peak for tetramethyl ammonium hydroxide $\{(\text{CH}_3)_4\text{N}^+, \text{OH}^-\}$ adsorbed on nickel surface.²

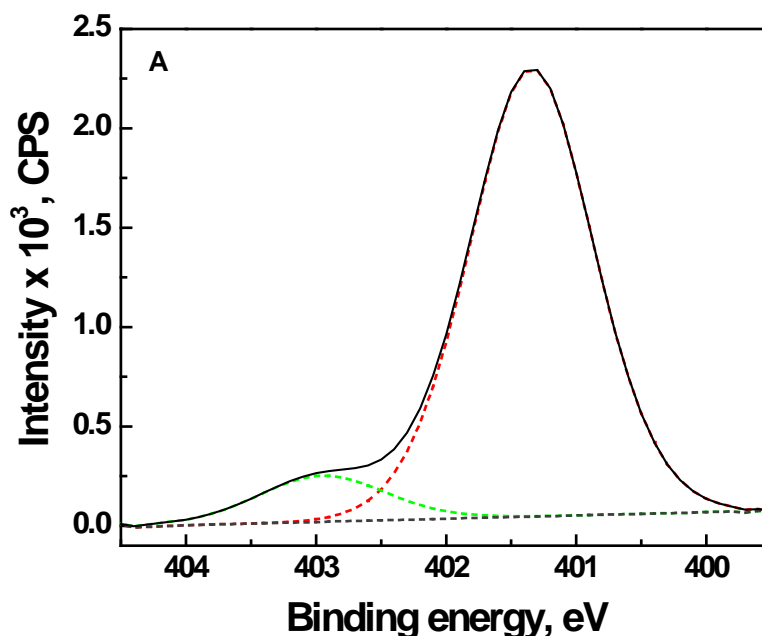


Fig. S2 N 1s narrow scan XPS spectrum for AuNPs.

Table S1: Fraction of the incident light absorbed by AuNPs of varying concentration in the mixture of MgTPP and AuNPs. The concentration of MgTPP in the mixture is constant at 5.3 μM , and the total light absorbed by this solution in the wavelength range (400-900 nm) is $494 i_0$. The total incident light intensity is $5000 i_0$.

Concentration of AuNPs (μM)	Amount of incident light absorbed by AuNPs	Total amount of incident light absorbed by the mixture (MgTPP + AuNPs)	The percentage of incident light absorbed by AuNPs in the mixture
2.17	$39 i_0$	$494 i_0 + 39 i_0 = 533 i_0$	7.3
4.33	$57 i_0$	$551 i_0$	10.3
8.67	$105 i_0$	$599 i_0$	17.3
22	$229 i_0$	$723 i_0$	31.7
43.3	$324 i_0$	$818 i_0$	39.6
65	$617 i_0$	$1111 i_0$	55.6
130	$1070 i_0$	$1573 i_0$	68.6

References of supporting information

- (1) J.R. Pels, F. Kapteijn, J.A. Moulijn, Q. Zhu, and K.M. Thomas, *Carbon*, 1995, **33**, 1641–1653.
- (2) C. Bureau, and P.D. Chong, *Chem. Phys. Lett*, 1997, **264**, 186-192.