Electronic Supplementary Material (ESI) for Journal of Materials Chemistry B

Preparation of core-shell Fe3O4@poly(dopamine) magnetic nanoparticles for biosensor construction

Miriam Martín[a, b], Pedro Salazar* [a, c], Reynaldo Villalonga[d], Susana Campuzano[d], José Manuel Pingarrón[d], José Luis González-Mora [a]

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Supplementary materials

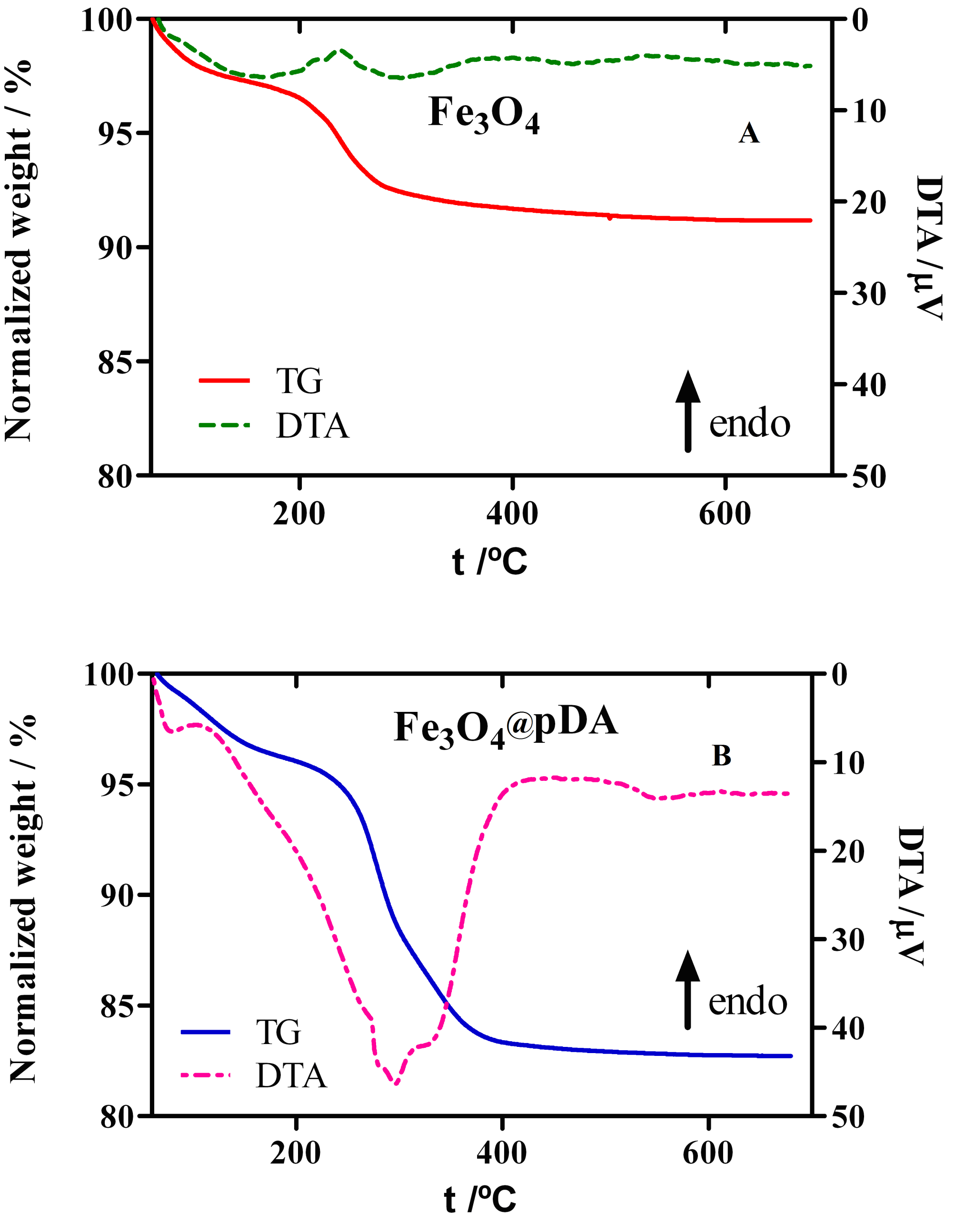

Figure SM1. Thermal analysis (TG and TDA) of Fe_3O_4 (A) and Fe_3O_4@pDA (B) nanoparticles.

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Figure SM2. Funcionalized magnetic nanoparticles (Fe_3O_4@pDA/HRP) under magnetic field.

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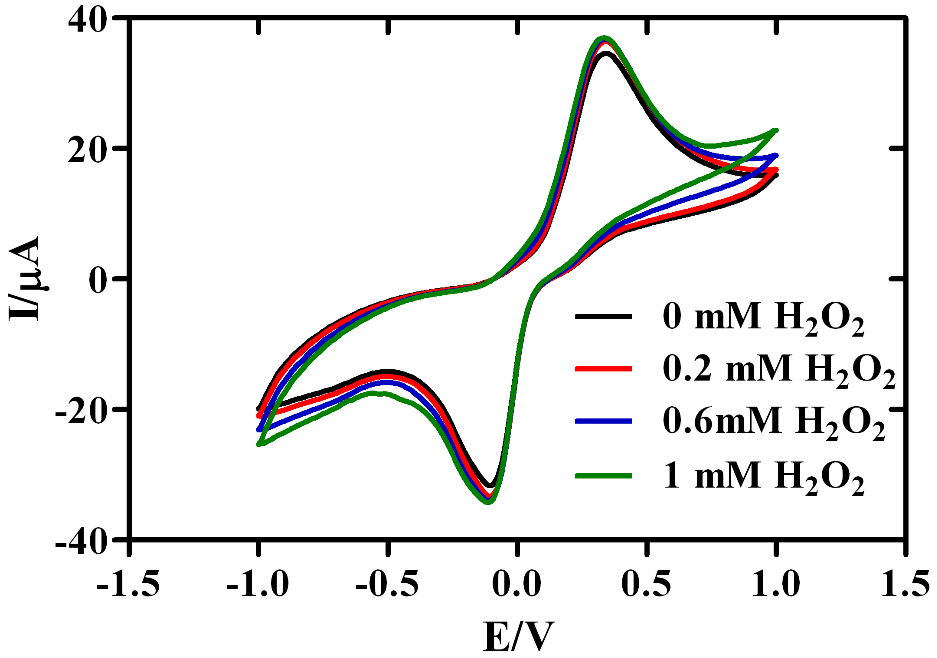

Figure SM3. CVs for GCE/Fe_3O_4@pDA recorded in PBS solution, pH 7.4 containing 1.5 mM HQ and 0, 0.2, 0.6, 1 mM H_2O_2 (scan rate: 100 mV/s).

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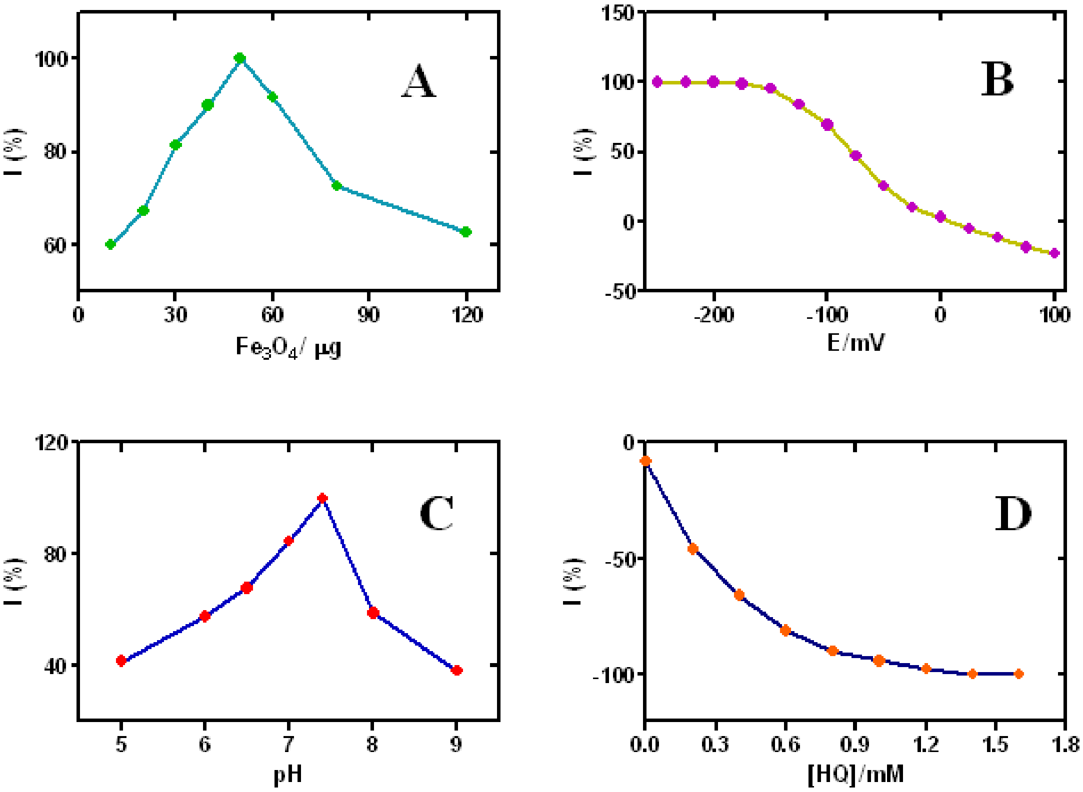

Figure SM4. Dependence of the: amount of Fe_3O_4@pDA/HRP nanoparticles (A), applied potential (B), pH of PBS solution (C) and hydroquinone concentration (D) on the current response for 0.5 mM H_2O_2 (in PBS containing 1.5 mM HQ) at GCE/Fe_3O_4@pDA/HRP.

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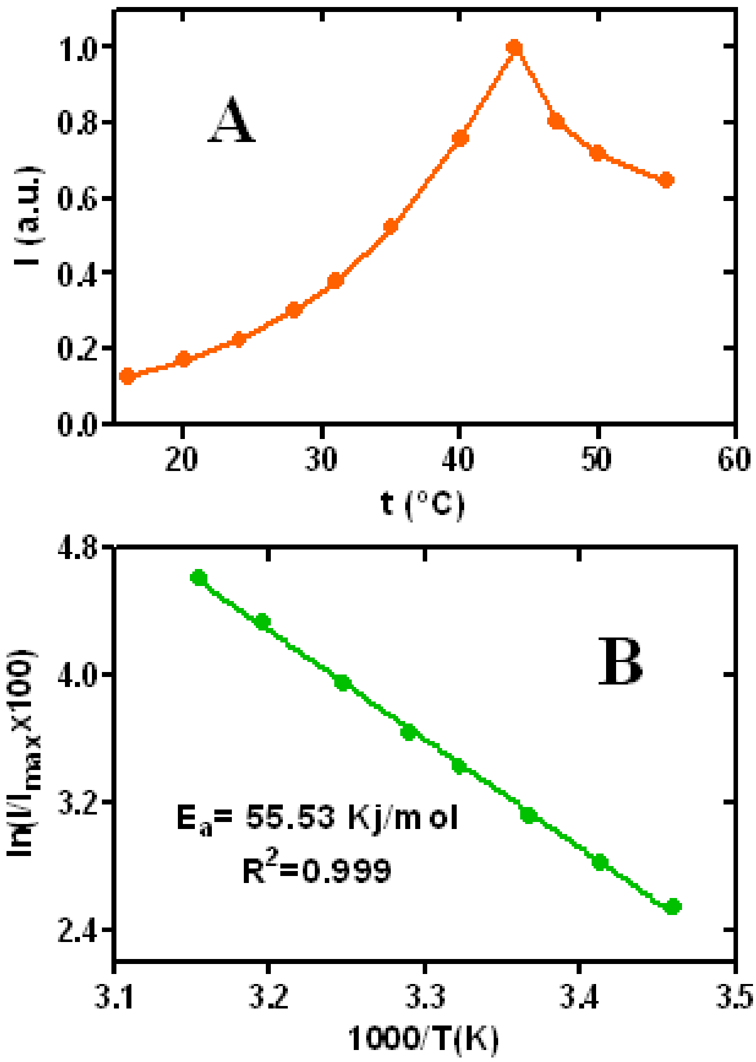

Figure SM5. (A) Dependence of the temperature on the current response for 0.5 mM H_2O_2 (in PBS containing 1.5 mM HQ) at GCE/Fe_3O_4@pDA/HRP and (B) Semi-log Arrhenius-type plot obtained for previous data.

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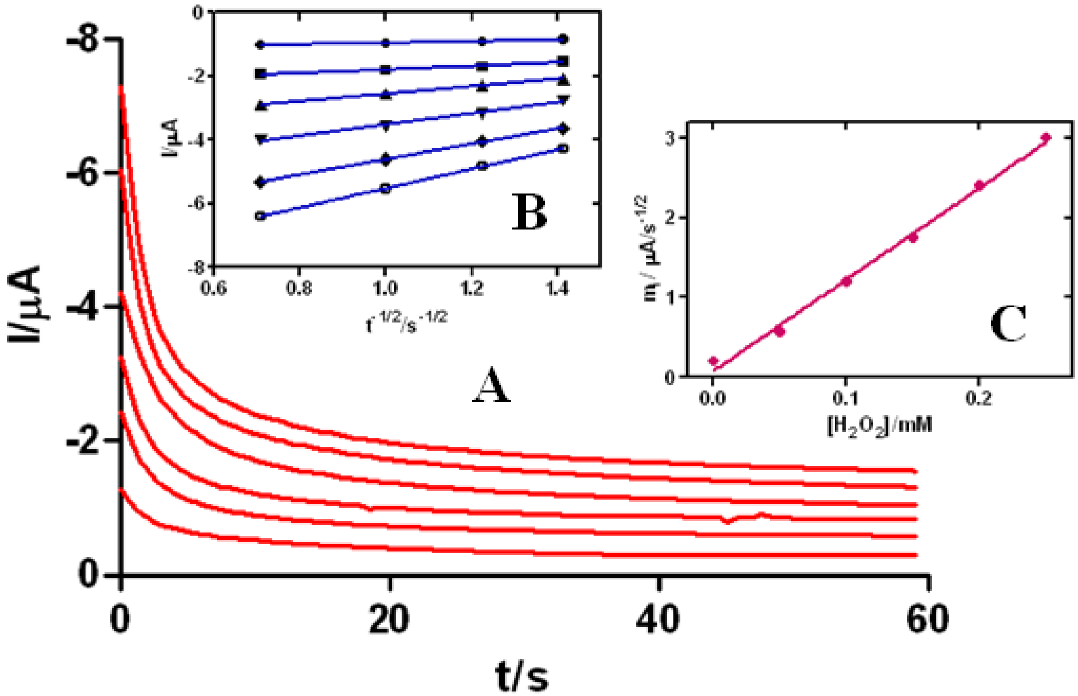

Figure SM6. (A) Chronoamperograms obtained for 0.0-1.0 mM H_2O_2 (in PBS, pH 7.4, containing 1.5 mM HQ at GCE/Fe_3O_4@pDA/HRP (E_{app}= -0.15 V) (B) plots of I vs. $t^{-1/2}$ obtained from the data of (A); (C) plot of the absolute values of the slopes (m_i) obtained from (B) vs. the concentration of H_2O_2.

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Compound	Interference ratio*
glucose	1
lactate	1
l-glutamate	1
choline	1
uric acid	0,92
ascorbic acid	0,52

*$I_{(0,1\ interference\ +1\ mM\ H2O2)}/I_{(1\ mM\ H2O2)}$

Table SM1. Possible interferents tested with the GCE/Fe_3O_4@pDA/HRP biosensor.