Supplementary material (ESI) for Nanoscale

Electronic Supplementary Information for:

Polyol synthesis, functionalisation, and biocompatibility studies of superparamagnetic iron oxide nanoparticles as potential MRI contrast agents

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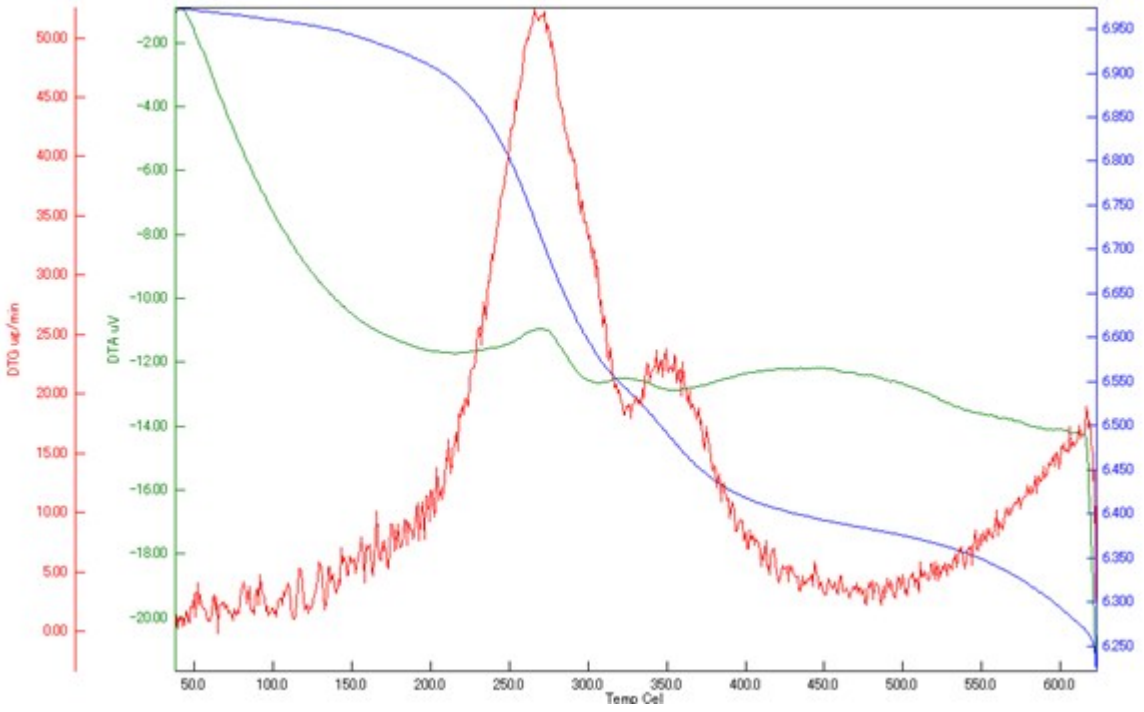
A)



B)

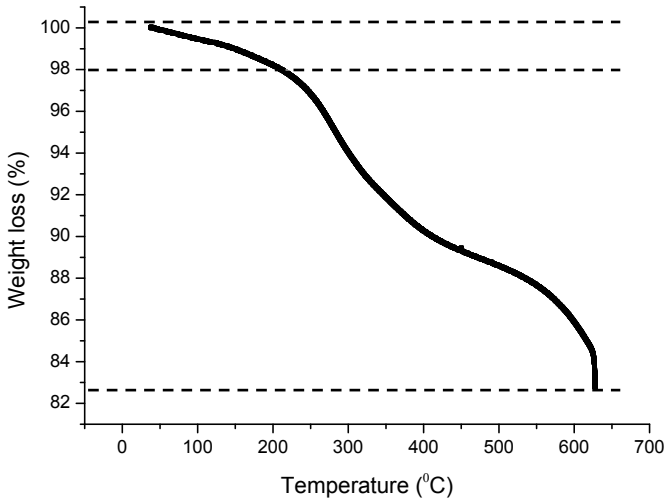


Fig. S 1. A) Weight loss curve (blue) and differential of the weight loss curve (red) of the iron oxide nanoparticles synthesised with triethylene glycol. The differential thermal analysis of an inert reference Al_2O_3 is indicated by the green curve and reflects the temperature difference between the sample and reference. B) Weight loss curve of TREG coated IONPs (% as a function of the temperature).

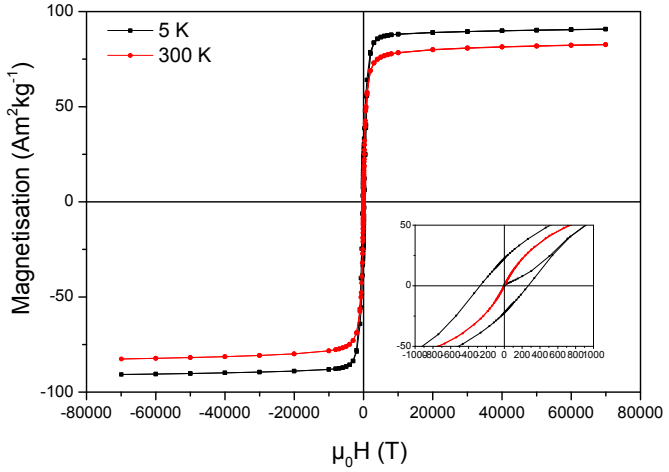


Fig S 2. Magnetisation curves of IONPs obtained with tri(ethylene glycol) in a conventional apparatus consisting of a round bottom flask, magnetic stirring and condenser.

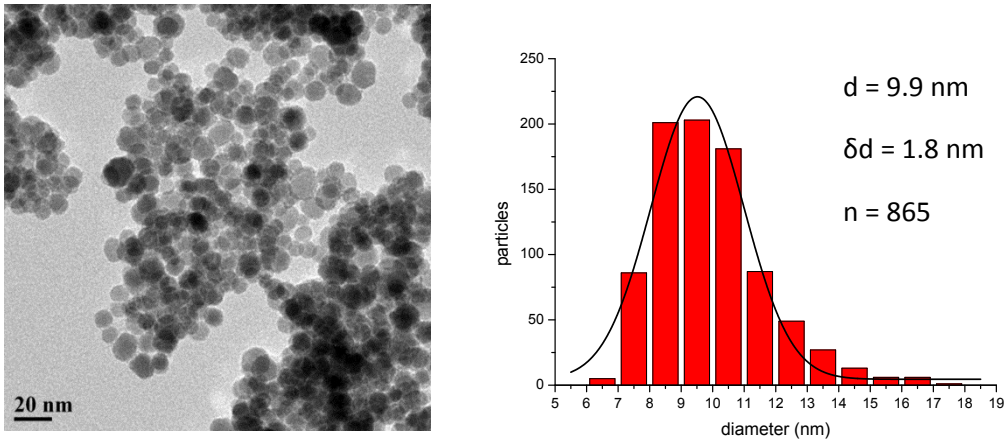


Fig. S 3. TEM image and particle size distribution of IONPs obtained with tri(ethylene glycol) in a conventional apparatus consisting of a round bottom flask, magnetic stirring and condenser.

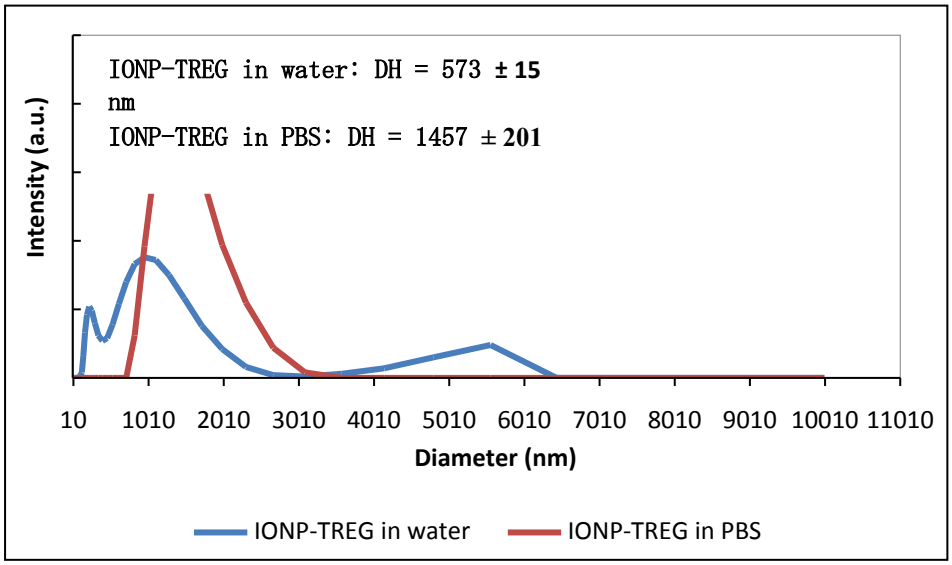


Fig. S 4. DLS measurements of IONP-TREG obtained in a conventional apparatus in water and PBS

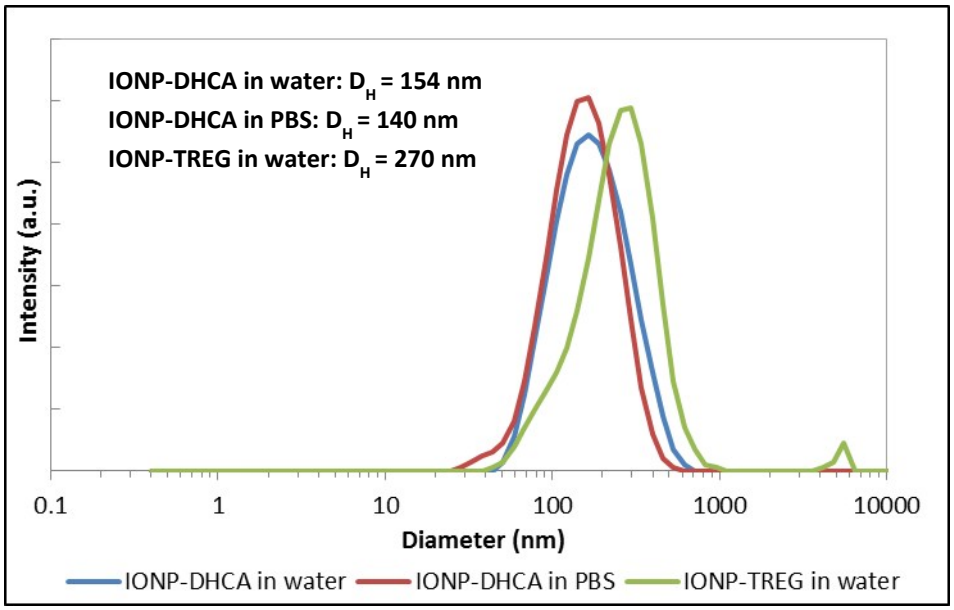


Fig. S 5. DLS measurements of IONP-TREG in water, IONP-DHCA in water and PBS post synthesis

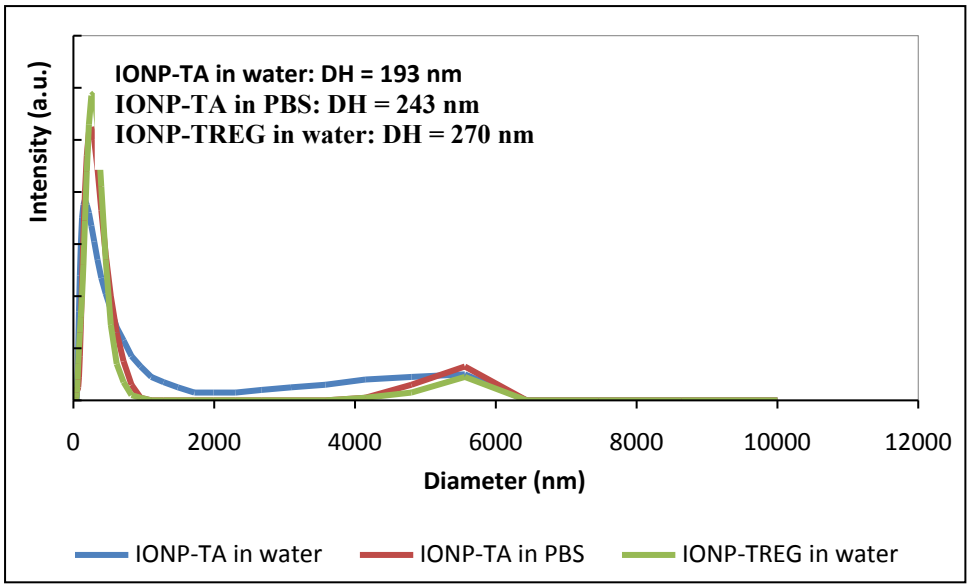


Fig. S 6. DLS measurements of IONP-TREG in water, IONP-TA in water and PBS post synthesis

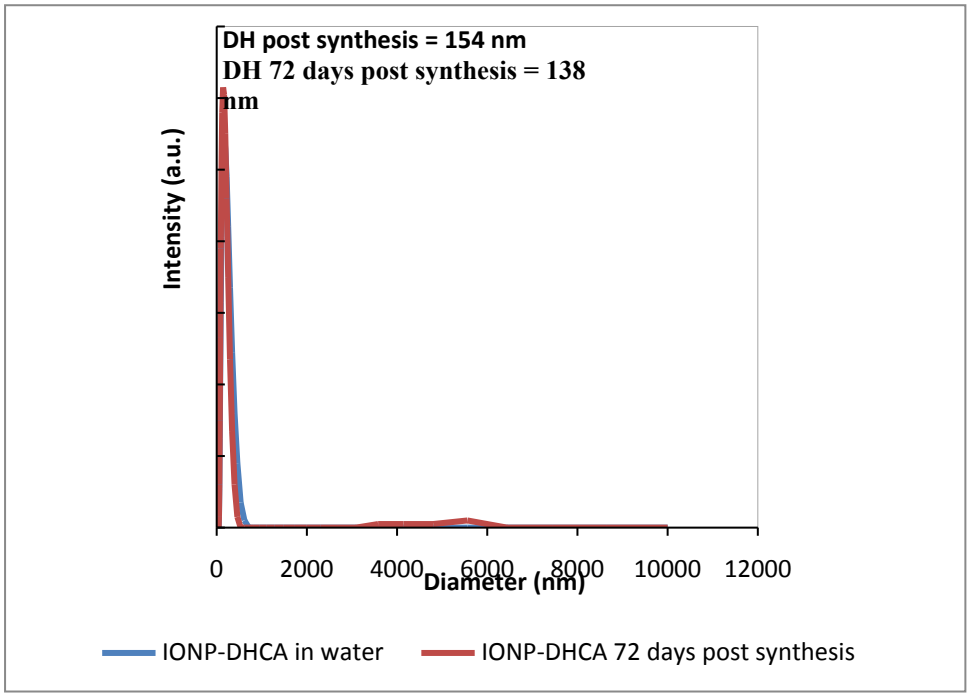


Fig. S 7. Dynamic light scattering measurements of IONP-DHCA in water 72 days apart

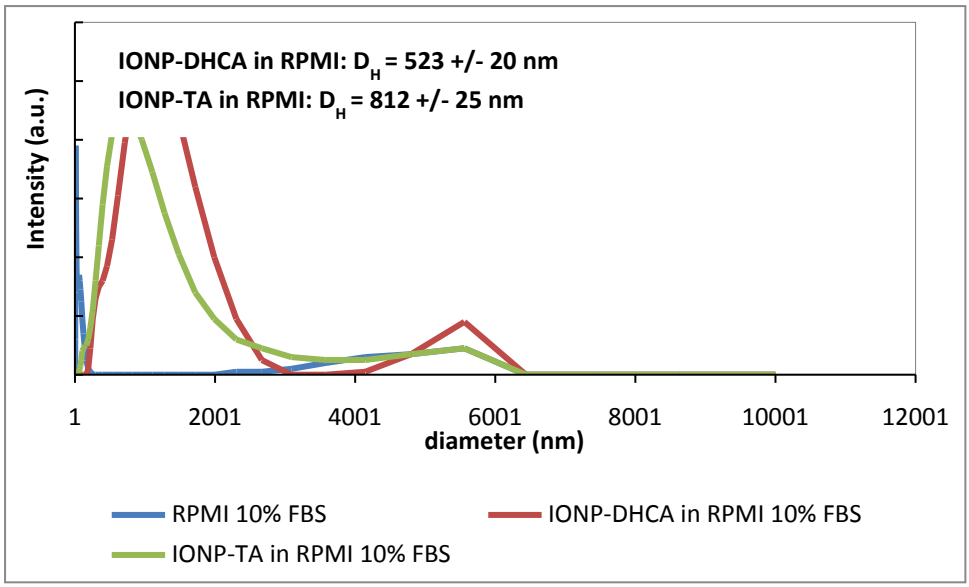


Fig. S 8. Dynamic light scattering measurements of RMPI 10% FBS, IONP-DHCA and IONP-TA in RPMI 10% FBS

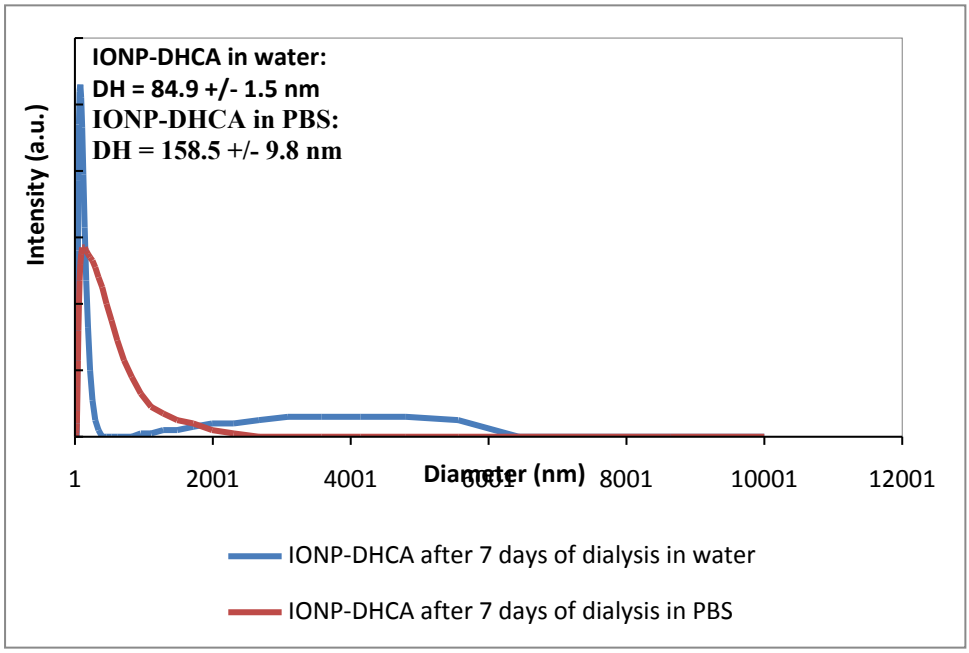


Fig. S 9. Dynamic Light Scattering measurements of IONP-DHCA in water and PBS after 7 days of dialysis.

Table. S 10. Summary of the different reaction conditions and the characteristics of the IONPs obtained

Reaction conditions	$D_{TEM} \pm \sigma$ TEM (nm)	D_{XRD} (nm)	Ms at 300 K (Am^2kg^{-1})
0.1 M $Fe(acac)_3$ in TREG 8 h in autoclave	9.1 ± 0.9	8.4	76.5
0.1 M $Fe(acac)_3$ in TEG 8 h in autoclave	13.9 ± 3.4	12.8	79.1
0.1 M $Fe(acac)_3$ in DEG 8 h in autoclave	5.8 ± 0.8	5.9	63.4
0.2 M $Fe(acac)_3$ in TREG conventional set-up	9.9 ± 1.8	9.8	81.8
0.2 M $Fe(acac)_3$ in TREG 8 h in autoclave	10.9 ± 1.1	8.9	84.4
0.2 M $Fe(acac)_3$ in TREG 1 h in autoclave	7.2 ± 0.8	6.2	61.2
0.2 M $Fe(acac)_3$ in TREG 24 h in autoclave	15.1 ± 1.9	13.5	88
0.4 M $Fe(acac)_3$ in TREG 8 h in autoclave	14.7 ± 3.5	14.7	82.71

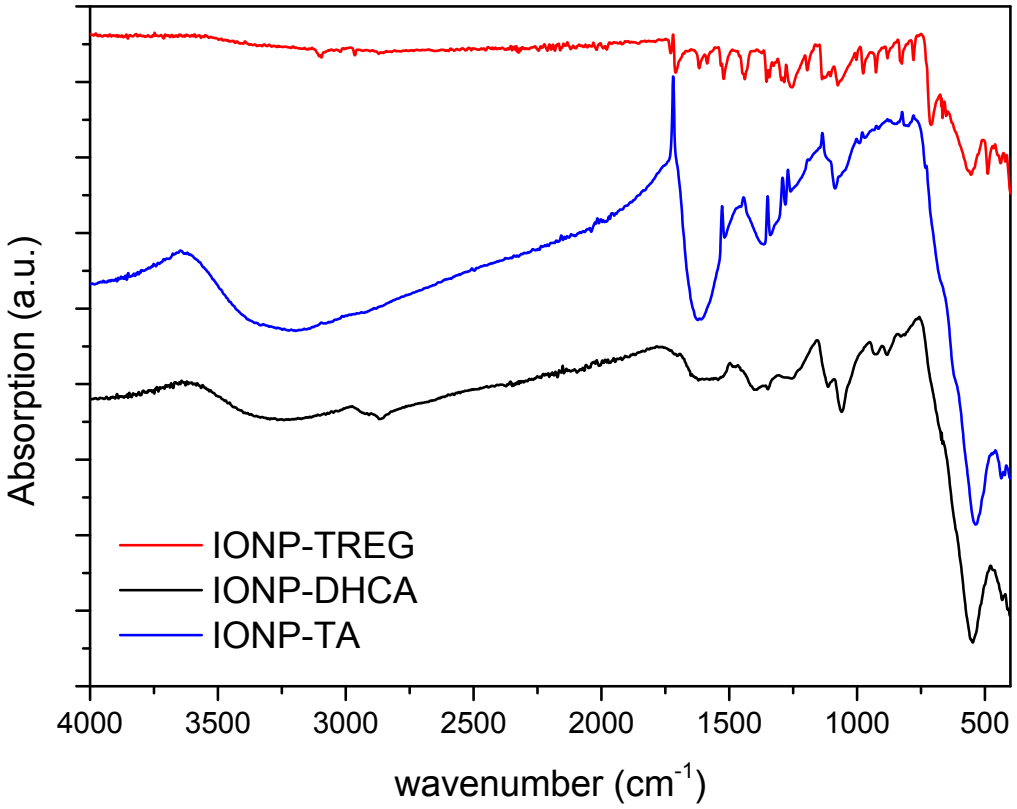


Fig. S 11. ATR-FTIR spectrum of IONPs coated with TREG (IONP), 2,3-dihydroxyhydrocinnamic acid (IONP-DHCA) and tartaric acid (IONP-TA).

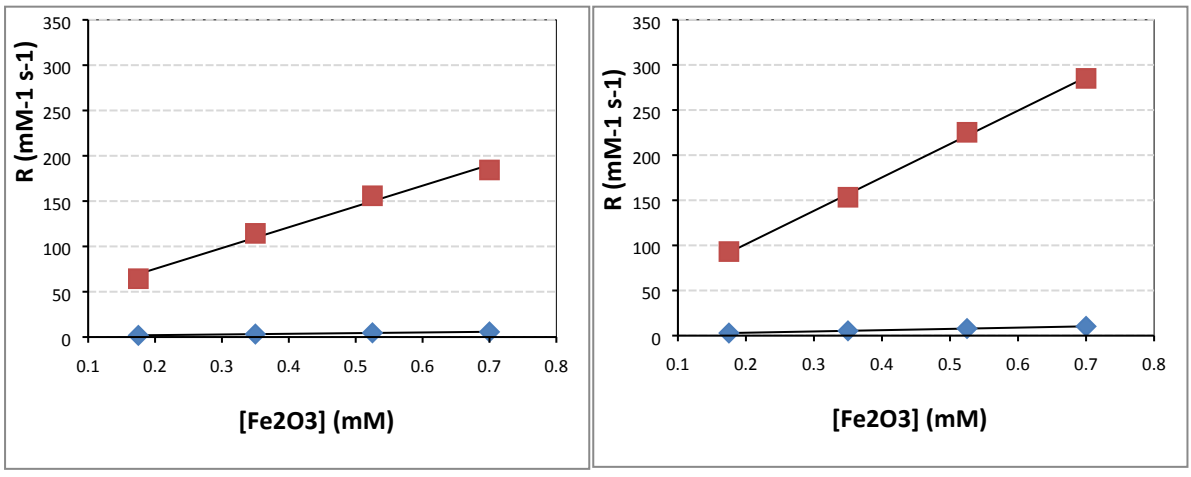


Fig. S 12. Plot of relaxation rate $1/T_1$ over Fe_2O_3 concentration of the IO-DHCA nanoparticles maintained at 250 °C during 12 h (left) and 24 h (right). The slope indicated the specific relaxivity (r_2 or r_1) of the samples.