Anticipating hyperthermia efficiency of magnetic colloids by a semi-empirical model: a tool to help medical decisions.


**Supplementary Information**

**Figure S1.** Shows TEM images and electron diffraction for samples (a-1-3) Cit/MNPs and (b-1-3) Cit/MNP-8. The MNPs are highly monodisperse and display somehow facetted faces. Mean particle sizes of 5.6 ± 0.8 nm and 8.0 ± 2.0 nm respectively, were obtained from the histograms also shown in the figure. Crystallinity is verified with electron diffraction shown in the insets. The images display well-defined lines belonging to cubic spinel structure (JCPDS #19-629) indicating that MNPs are single phase. Then, these colloids consist of almost identical SD-IONPs of uniaxial anisotropy in random directions. (c) The X-ray diffraction for sample U/MNP-14 patterns display well-defined peaks belonging to the cubic spinel structure, indicating a single phase. The whole patterns were refined, including peak broadening due to crystallite size, using a cubic spinel structure (space group Fd3m) with lattice parameter $a = 8.378$ Å and the O atoms arranged in a face-centered-cubic lattice. The patterns were determined with an X’Pert Diffractometer within a 2θ range from 20 to 80°. Refinement was performed using MAUD program [1].
**Figure S2**: Size dependence of the energy barrier ($U$). Our results are compared with other values reported in literature for iron oxides particles in the same range size.

![Graph showing size dependence of the energy barrier ($U$)](image)

**Figure S3** Magnetization curves at 300 K for colloids Cit/MNP-6, Cit/MNP-8 and U/MNP-14.

![Magnetization curves for different colloids](image)
Figure S4. A.C. Susceptibility measurements for samples (a) Cit/MNP-6, (b) Cit/MNP-8, (c) CS/MNP-5 and (d) CS/MNP-10. Insets shows a zoom of the data around the maximum to more clearly display its shift with increasing temperature.
Figure S5. Concentration-normalized heating curves measured at 52 kA/m and 260 kHz.

References


