Supporting Information

# Magnetic Nanoparticles Create Hot Spots in Polymer Matrix for Controlled Drug Release

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## Magnetization Measurement

The magnetization curve M(H) (Figure S1) of a suspension of monodisperse γ-$Fe_2O_3$ NPs can be described by Langevin's law. Thus, fitting the Langevin curve to the experimental magnetization curve and assuming a log-normal distribution P(d) (Equatoin (S1)), the magnetic diameter ($d_0$) and the polydispersity index (σ) of MNPs solutions are calculated:

$$P(d) = \frac{1}{\sqrt{2\times\pi\times\sigma\times d}} \times exp\left[-\frac{ln^2(d/d_0)}{2\times\sigma^2}\right] \quad \text{(S1)}$$

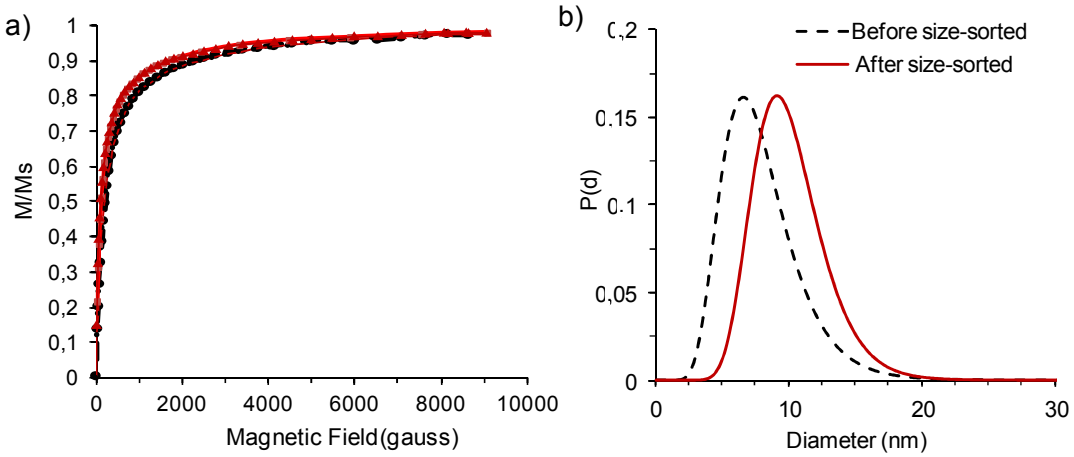


**Figure S1.** (**a**) Magnetization curve of γ-$Fe_2O_3$ NPs (red points, Langevin model; black points, experimental curve) at 298 K, measured by VSM. (**b**) Size distribution before and after size-sorting modeled from the experimental data of (**a**) with a lognormal law (Langevin's function model).

## TEM Analysis

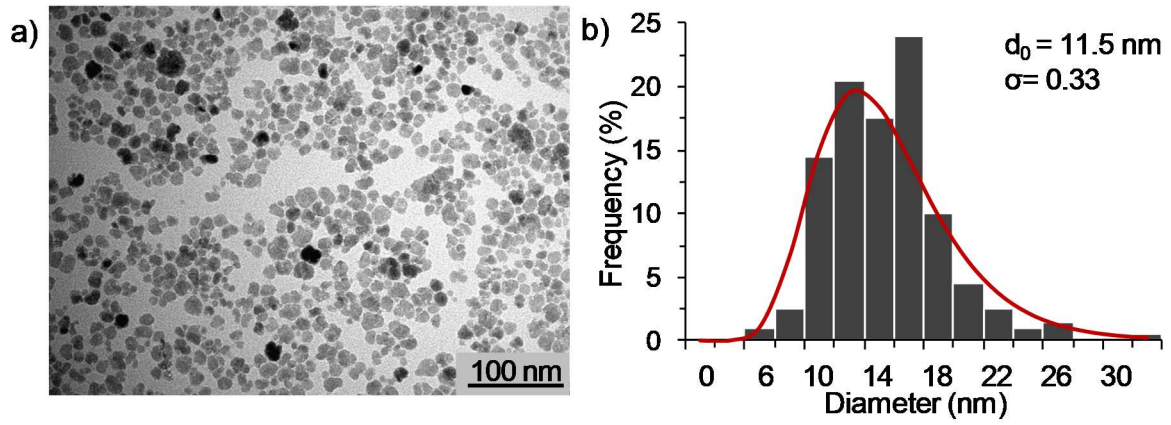


**Figure S2.** (**a**) TEM image of bare, size sorted γ-$Fe_2O_3$ NPs. (**b**) Size distribution of γ-$Fe_2O_3$ NPs obtained by TEM image analysis (n = 200 NPs; log-normal distribution model (red line) with $d_0$ = 11.5 nm and σ = 0.33.

## FTIR and DLS on MagMIP Nanoparticles

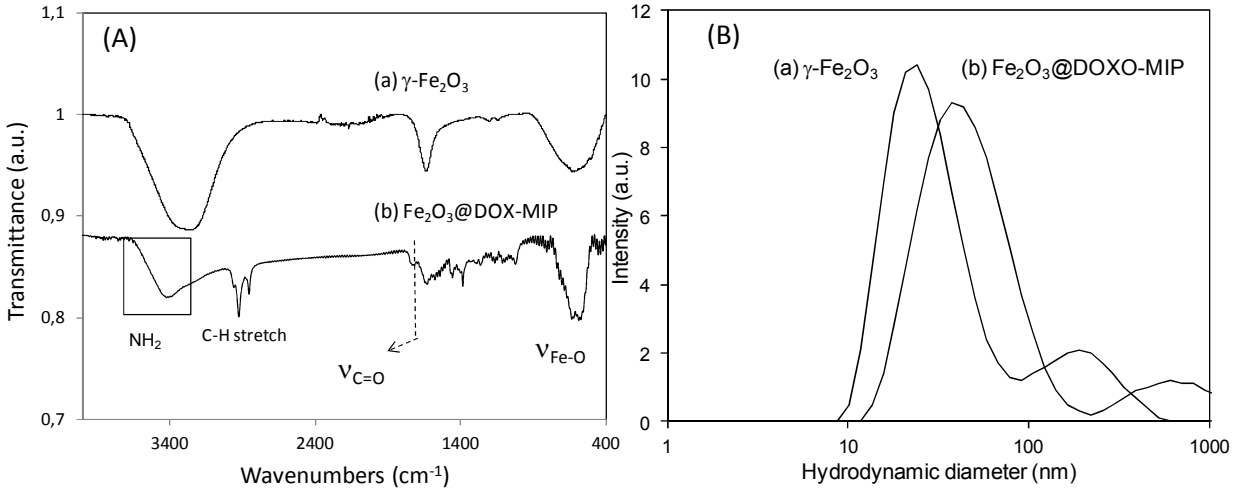


**Figure S3.** (**A**) FT-IR spectra and (**B**) size distribution from DLS of bare γ-$Fe_2O_3$ (a) and MagMIP nanoparticles (b).

**ATG Curve of MagNanogels and MagMIP**

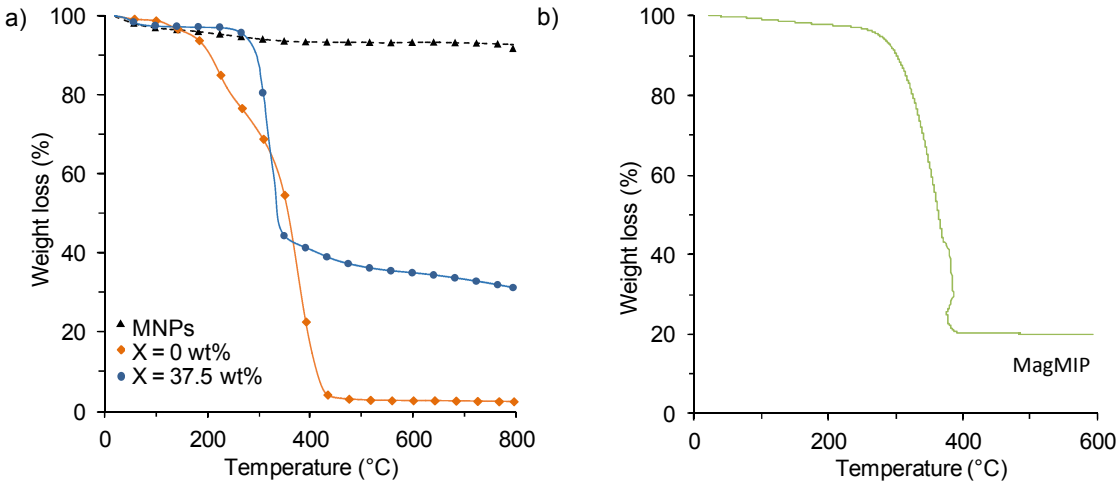


**Figure S4.** Thermogravimetric analysis ($N_{2(g)}$; 10 °C.min$^{-1}$) of (a,b) γ-$Fe_2O_3$ magnetic nanoparticles; (**a**) MagNanoGels-Xt% loaded with X = 0 and 37.5 wt% MNPs and (**b**) MagMIPs