## **Supplementary Information**

## Magnetic Response of *CoFe*<sub>2</sub>*O*<sub>4</sub> Nanoparticles Confined in Microgel Meshes

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Fig. 1 TEM image of the MNPs with a average size of  $12.3 \pm 3.2$  nm.



Fig. 2 Hydrodynamic radius of the synthesized microgels MG1 (no AM) and MG2 (with AM) in dependence of the temperature for the first heating and cooling cycle. The MGs show the well known shrinking and swelling behavior with a VPTT close to 32 °C.



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Fig. 3 Hydrodynamic radius of the magnetic microgels MMG1 (no AM) and MMG2 (with AM) in dependence of the temperature for the first heating and cooling cycle. The MMGs show the preserved shrinking and swelling behavior with a VPTT close to 32  $^\circ$ C.

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**Fig. 4** AC susceptibility measurements of MMG1.  $\chi''$  is plotted over the AC excitation frequency for temperatures between 40 °C and 50 °C. The AC susceptibility measurements above 40 °C show no distinctive peak. For fully collapsed MMGs the peak is expected to be at  $\approx 10$  Hz. Above 40 °C the signal amplitude is 15 times smaller than for below 40 °C.



**Fig. 5** AC susceptibility measurements of MMG2.  $\chi''$  is plotted over the AC excitation frequency for temperatures between 40 °C and 50 °C. The AC susceptibility measurements above 40 °C show no distinctive peak. For fully collapsed MMGs the peak is expected to be at  $\approx 10$  Hz. Above 40 °C the signal amplitude is 24 times smaller than for below 40 °C.



Fig. 6 Magnetization of the cobalt ferrite MNPs measured as powder.



**Fig. 7** The hydrodynamic radius for MMG2 is plotted over the temperature. In black are the simulated sizes (extracted via a Gaussian fit from effective diameters) from the AC susceptibility measurements and in red from the dynamic light scattering.