

Electronic supplementary information (ESI) for

Poly(ω -pentadecalactone) decorated Magnetic Nanoparticles

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S1: Experimental Details

Methods

Samples for TEM were prepared by applying a drop of the nanoparticle solution in CHCl₃ (20 mg in 5 mL CHCl₃) onto a TEM grid covered with carbon film and evaporating the solvent completely at room temperature.

SEM measurements were performed at an accelerating voltage of 10 kV. Ultra thin sections of 70 nm from the PPDL-DMA/mgNP-PPDL nanocomposite were cut on a Leica FC6 cryo ultra-microtome at 130 °C (Leica Microsystems GmbH Wetzlar, Germany).

MALDI-TOF measurements were performed in the positive linear mode with *trans*-2-[3-(4-*tert*-butylphenyl)-2-methyl-2-propenyldene]malononitrile (DCTB in CHCl₃ : potassium trifluoroacetate) as a matrix. Ions were generated by a nitrogen laser emitting at 337 nm and were accelerated at 20 kV. The detector voltage was 2.4 kV, and the mass spectra were averaged from 500 laser shots.

The multidetector GPC-system consisted of two 300 mm x 8.0 mm linear M columns (Polymer Standard Service, Mainz, Germany), an isocratic pump 2080 and an automatic injector AS 2050 (both Jasco, Groß-Umstadt, Germany), a RI detector Shodex RI-101 (Showa Denko Europe, Munich, Germany), and a differential viscometer/light scattering dual detector T60A (Viscotek Europe, Crowthorne, UK) using chloroform as eluent at 35 °C with a flow rate of 1.0 mL·min⁻¹, and 0.2 wt% toluene as internal standard.

In the magnetic measurements the maximum magnetic field for hysteresis loops was set to $\pm$ 500 mT. Measurements were performed in steps of 5 mT. The samples were prepared by sticking a small amount of the material on a piece of pergamyne paper with super glue. A small rectangle was then cutted out and fastened at the sample holder of the AGM. The

samples were demagnetized before measuring to obtain the initial magnetization as well. A sample with glue and pergamyne only was also measured as a reference.

Figure S2

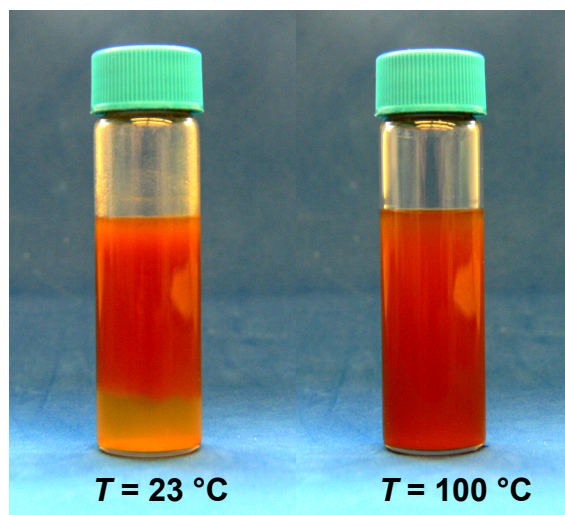


Figure S2: Photo images of mgNP(1)PPDL(1.9) in DMSO at room temperature (left) and at $100\text{ }^{\circ}\text{C}$ (right).

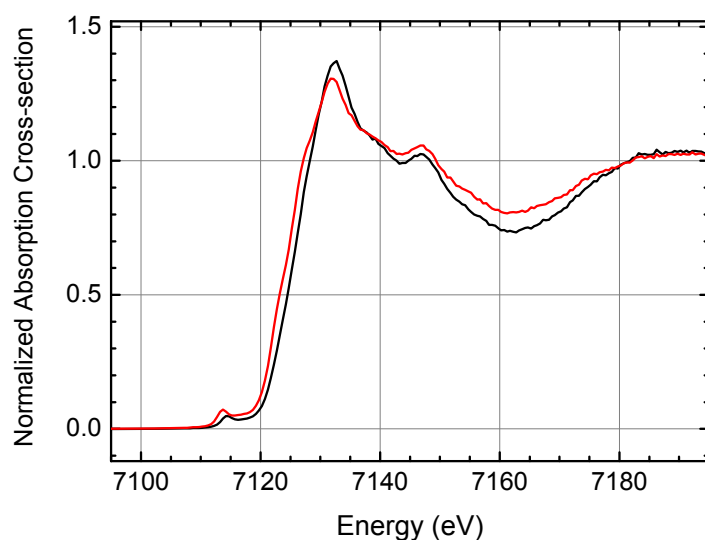


Figure S3: XANES spectra at the iron K-edge for pure mgNP, black line and mgNP(1)PPDL(1.9), red line.

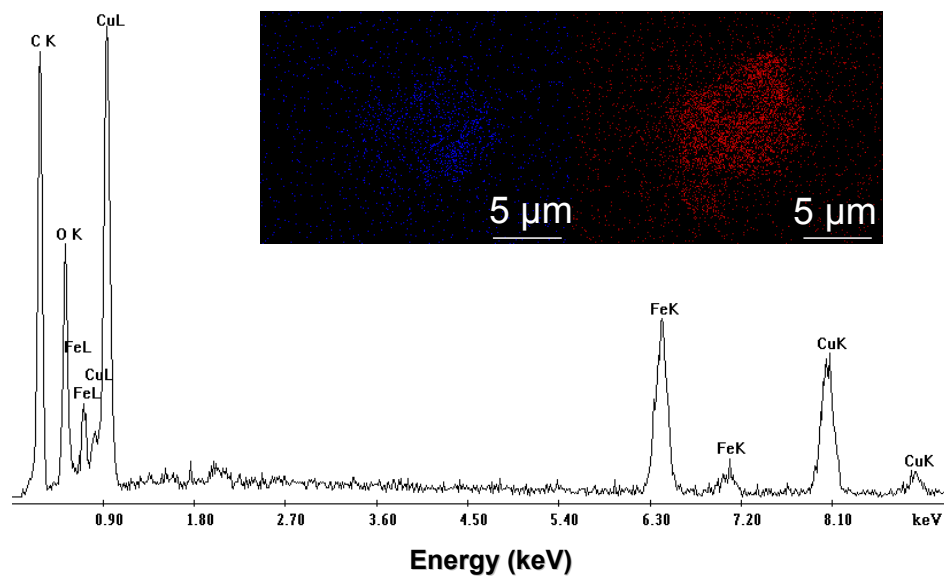


Figure S4: EDX pattern of mgNP(1)PPDL(1.9) with insets showing the elemental distribution of Fe (blue) and carbon (red).