Supplementary Material (ESI) for Journal of Materials Chemistry

Effect of grafting method on the colloidal stability and *in vitro* cytotoxicity of carboxymethyl dextran coated magnetic nanoparticles

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Supporting Information

Supporting information includes size distribution histogram from TEM imaging of iron oxide nanoparticles (Fig. S1), equilibrium magnetization measurements for particles suspended in deionized water (Fig. S2), TGA curves for particles with adsorbed CMDx before and after suspension in PBS for 24 hours (Fig. S3), and FT-IR spectra for particles with adsorbed CMDx before and after suspension in PBS for 24 hours (Fig. S4).

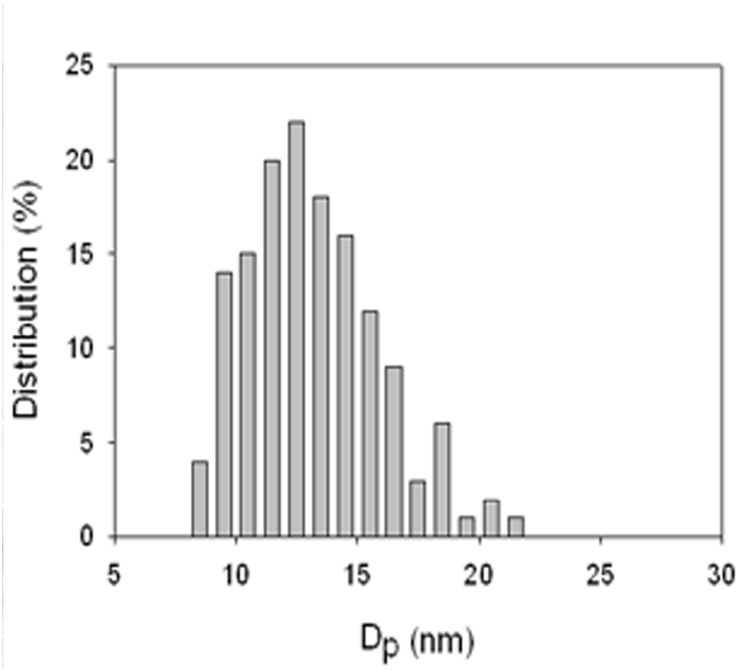

Fig. S1 Size distribution histogram of iron oxide (IO) magnetic nanoparticles synthesized by the co-precipitation method. A number mean diameter of 12.5 nm with a standard deviation of 2.78 nm were estimated from the normal distribution.

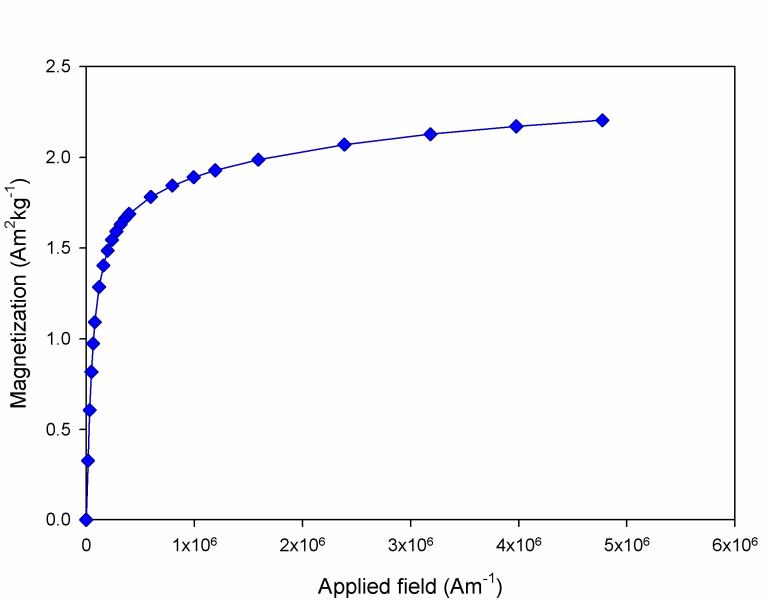

Fig. S2 Equilibrium magnetization at 300 K of iron oxide (IO) magnetic nanoparticles synthesized by the co-precipitation method and suspended in deionized water after peptization with tetra-methyl ammonium hydroxide.

The magnetic core size of the synthesized nanoparticles was calculated using the equations due to Chantrell et al. [29]

$$D_p = \left[\frac{18kT}{\pi \mu_0 M_d} \sqrt{\frac{\chi_0}{3 M_s H_0}} \right]^{1/3}, \quad \sigma_g = \left[\frac{1}{9} \ln \left(\frac{3\chi_0 H_0}{M_s} \right) \right]^{1/2}$$

Where M_d is the domain magnetization (which was assumed as 4.46×10^5 A/m), χ_0 as the initial susceptibility of the suspension (the slope of the magnetization curve at zero field), k is Boltzmann's constant (1.38×10^{-23} JK^{-1}),

T is the temperature of the system, μ_0 is the permeability of free space ($4\pi\times10^{-7}$ Hm^{-1}), and H_0 is a characteristic field. The values of M_s and H_0 are obtained by plotting the high field response of equilibrium magnetization as a function of the inverse of the magnetic field, from which M_s is the intercept of the curve M vs $1/H$ at $H \rightarrow \infty$, and H_o is the value of H when $M=0$.

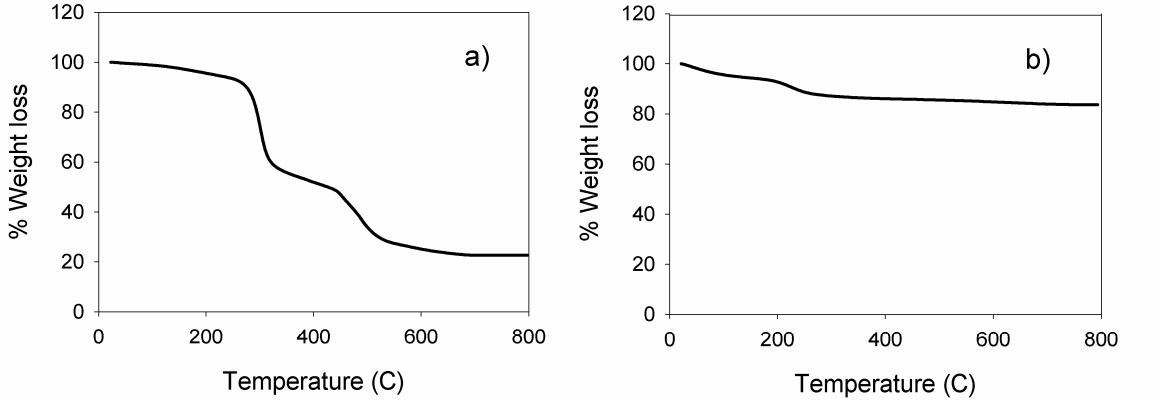

Fig. S3 Thermogravimetric analysis of IO-adsCMDx a) before suspension in PBS and b) after suspension in PBS. The weight loss was a) 77.24% and b) 16.34%.

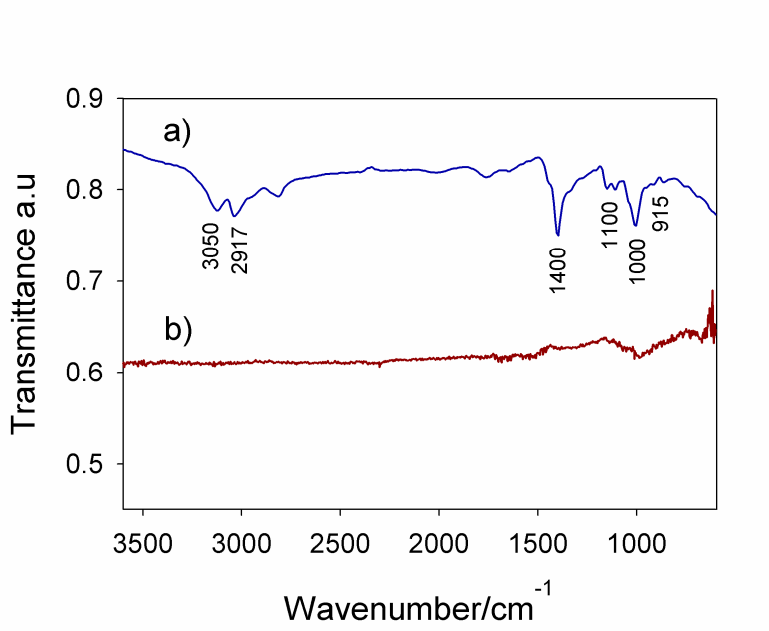

Fig. S4 FTIR spectra of a) IO-adsCMDx nanoparticles and b) IO-adsCMDx nanoparticles after 24 h suspended in PBS buffer.