

# Superparamagnetic behavior in well dispersible magnetite core-shell $\text{Fe}_3\text{O}_4@\text{SiO}_2$ nanoparticles

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Magnetic properties of core-shell  $\text{Fe}_3\text{O}_4@\text{SiO}_2$  nanoparticles were measured with use of AC and DC magnetometry. Particles were in form of crystalline magnetic core of 11.5 nm and an amorphous silica shell. The magnetic measurements confirmed superparamagnetic nature of particles. Hysteresis loops exhibit typical temperature dependence of coercivity  $H_c$ , with lowering temperature  $H_c$  increases. Moreover hysteresis loops does not saturate at any temperature confirming that  $\text{Fe}_3\text{O}_4$  surface spins are highly disordered due to high surface anisotropy.

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