

**Kinetics of (3-Aminopropyl)triethoxysilane (APTES) Silanization of
Superparamagnetic Iron Oxide Nanoparticles**

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Kinetics study of APTES silanization

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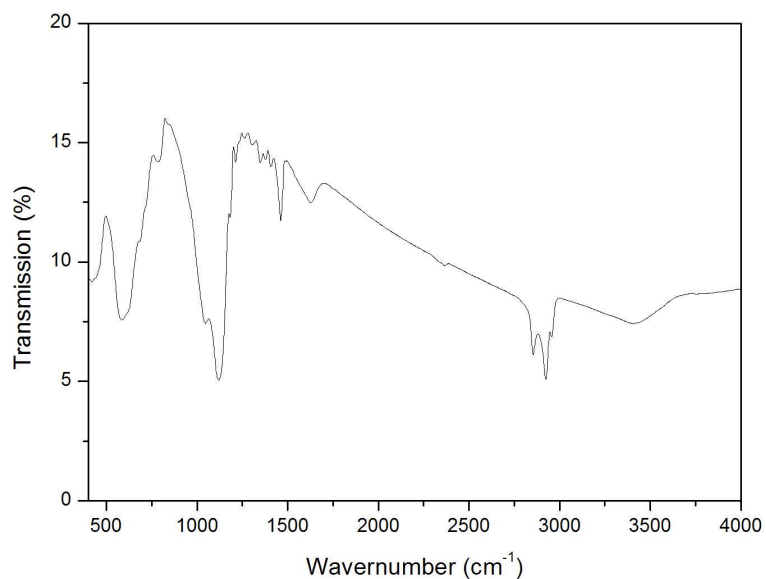


Figure S1. IR spectrum of MNP-NH₂ with absorption peaks at 580 cm⁻¹ (Fe-O), 1060 (Si-O), 1620 cm⁻¹ (NH in plane stretching), 2928 cm⁻¹ (CH₂ asymmetric stretching), and 3420 cm⁻¹ (NH₂).

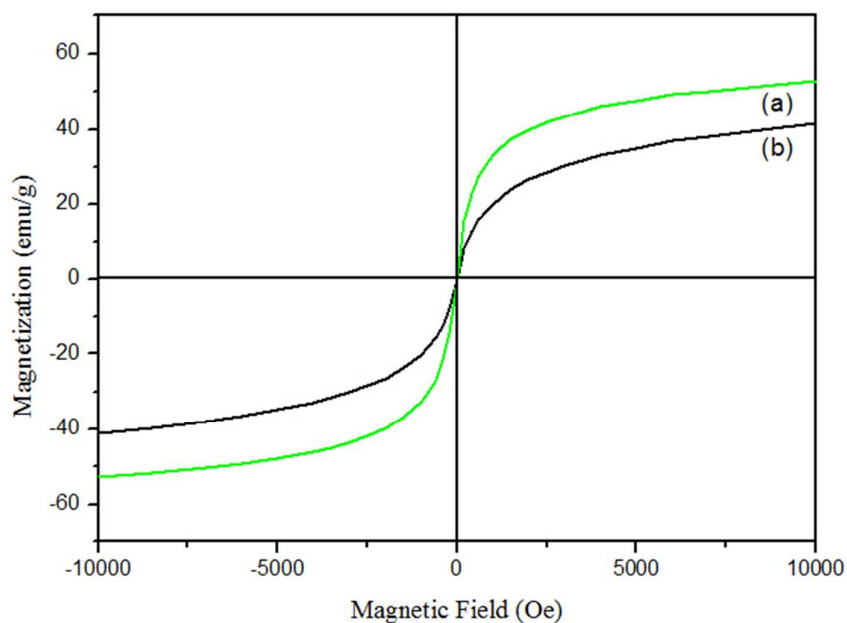


Figure S2. Magnetization properties of bare MNP(a) and APTES modified MNP(b)

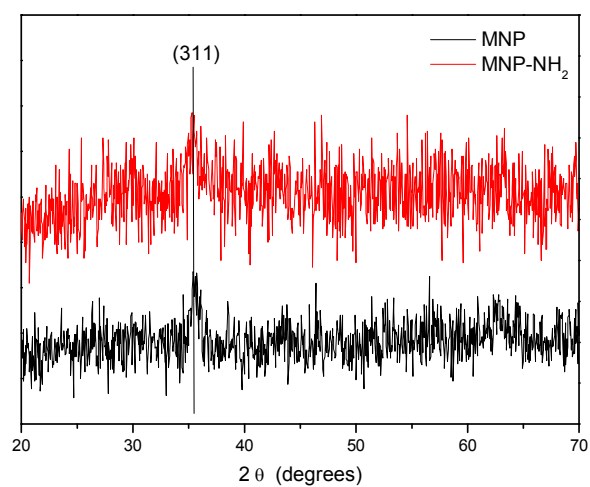


Figure S3. X-ray diffraction patterns of MNP and MNP-NH₂. The peak position at 2θ of 35.8 degrees corresponds to the (311) lattice peak of Fe₃O₄ crystals confirming the composition of the MNP is Fe₃O₄.

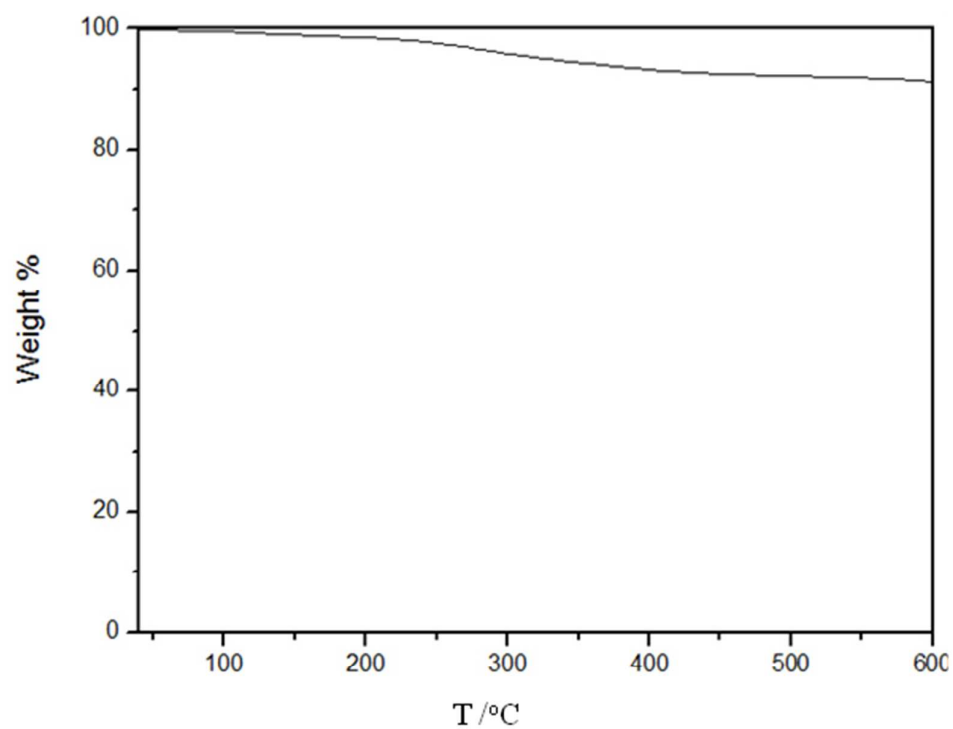


Figure S4. The TGA weight change profile of MNP-NH₂ nanoparticles

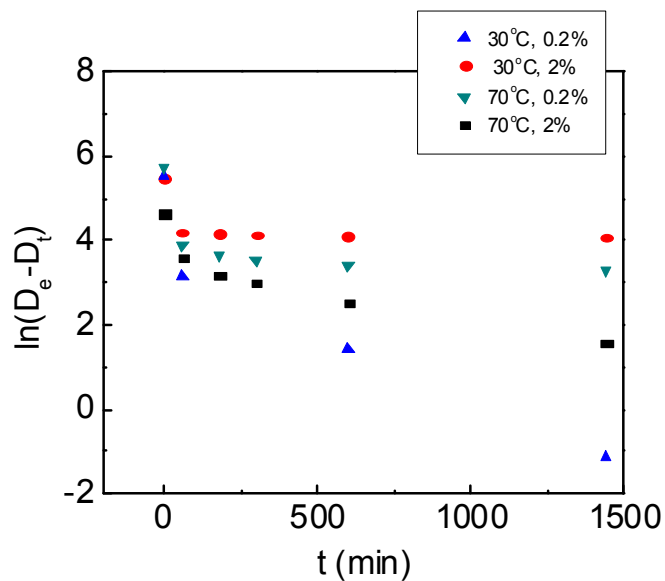


Figure S5. The kinetics of MNP nanoparticles coated with APTES using water as the solvent as fitted by Lagergren pseudo-first model. No linear relationship was found between the $\ln(D_e - D_t)$ with reaction time.

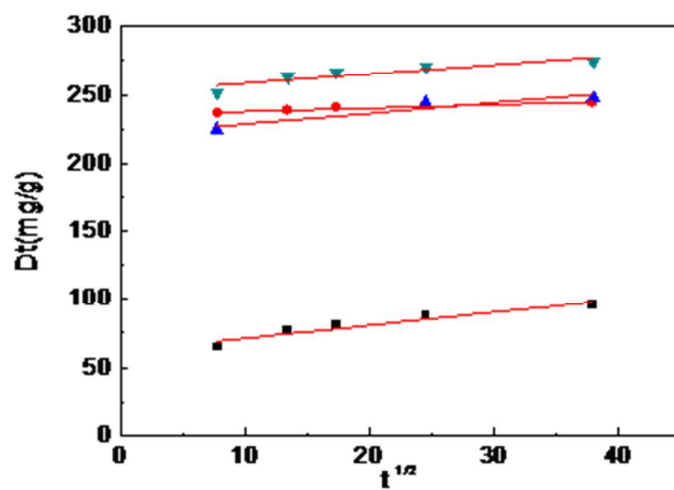


Figure S6. The kinetics of MNP nanoparticles silanization with APTES using water as the solvent as fitted by intra-particle diffusion model

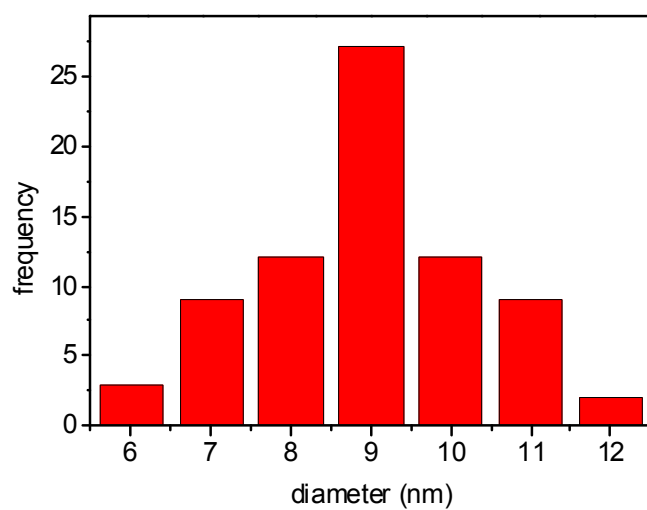


Figure S7. Histogram of magnetic nanoparticles (MNP) based on TEM image analysis