Electronic Supplementary Material (ESI) for Journal of Materials Chemistry A

Supporting Information for

Facile green synthesis of Nickel nanostructures using natural polyol and morphology dependent dye adsorption properties

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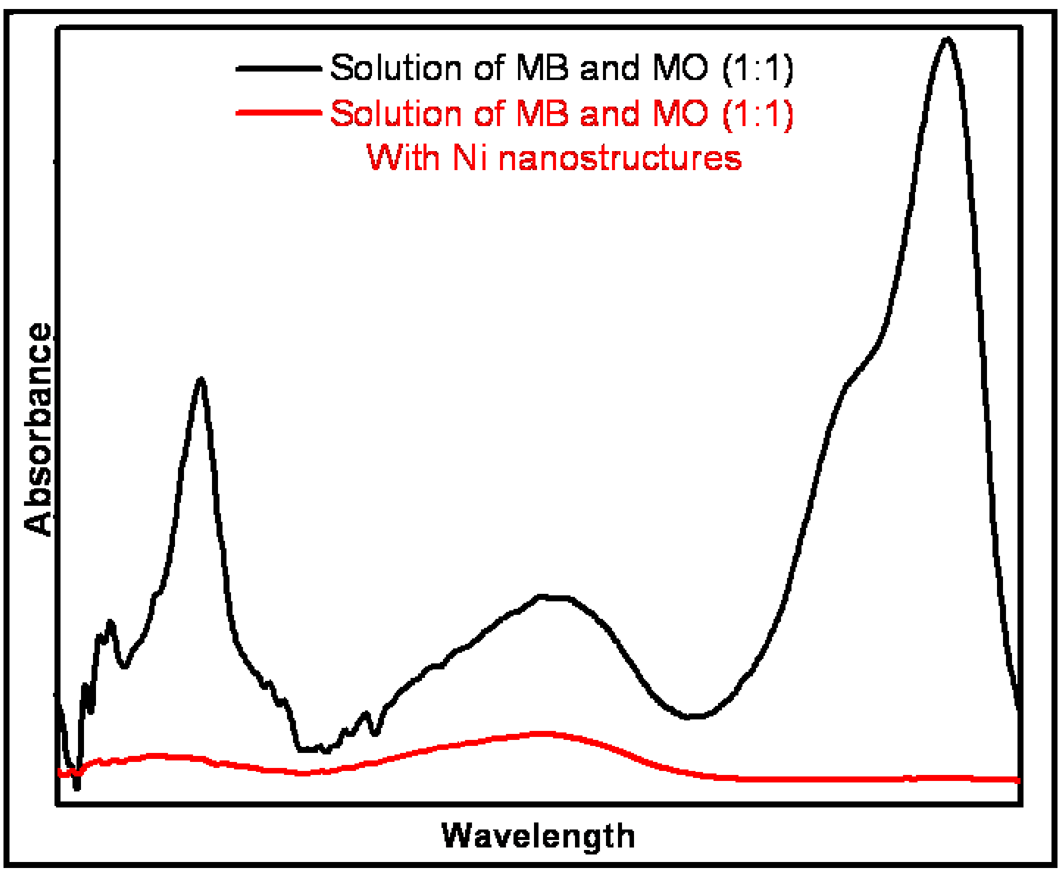

Fig. S1. Uv-Vis adsorption diagram showing the fast adsorption of MB in comparison to MO.

Magnetic studies of Ni nanostructures

The absence of superparamagnetism (spm) in the Ni nanostructures was analyzed by the magnetization measurements in low temperature and zero field cooling-field cooling (ZFC-FC) analysis of the Ni nanostructures. In case of nanospheres they seem to be well dispersed at a larger distance (TEM image Fig. 6a, main manuscript) so weak ferromagnetic exchange interaction leads to lower magnetic moment than voluminous nanorod assemblies (TEM image, Fig. 5e). The low corecitivity values indicate absence of single domain nanospheres formation. Low temperature magnetization curve at 80K (Fig. S2a) shows a decrease of magnetic moment value 1.8 emu/g of nanorods compared to 3 emu/g at 300K, exhibits that at low temperature surface spins of Ni nanorods are pinned due to surface modification. Due to higher surface area of nanorods, larger surface spins were exposed. While magnetic moment of nanospheres increased to 2 emu/g. In order to analyze the formation of ferromagnetic single domain spheres ZFC-FC curve has been taken at 100 Oe for both samples as shown in Fig. S2b and S2c. For nanorods there are no maxima in ZFC curve at low temperature demonstrating nanorods is not single domain ferromagnetic i.e. superparamagnetic nature. The behavior of ZFC curve indicates the typical multidomain ferromagnetic clusters. Both ZFC-FC curve starts to superimpose around 230K exhibiting irreversible temperature for Ni nanorods a typical performance multidomain ferromagnetic clusters. ZFC-FC (Fig. S2c) curve for Ni nanosphere sample exhibited maxima in ZFC curve. It shows formation of some single domain ferromagnetic Ni nanosphere exhibiting spin relaxation temperature. While maximum at 130 K shown by nanospheres represent the lower spin relaxation temperature than nanorods. Ferromagnetic transition temperature of both samples has been determined at 1KOe applied magnetic field by measuring magnetic moment vs. temperature plot as shown in Fig. S2d. Both the samples follow typical Curie-Weiss law for ferromagnetic materials. No exponential fall of magnetic moment exhibited by any samples ruling out super paramagnetic behavior. Both samples showed almost identical transition temperature, 375°C.

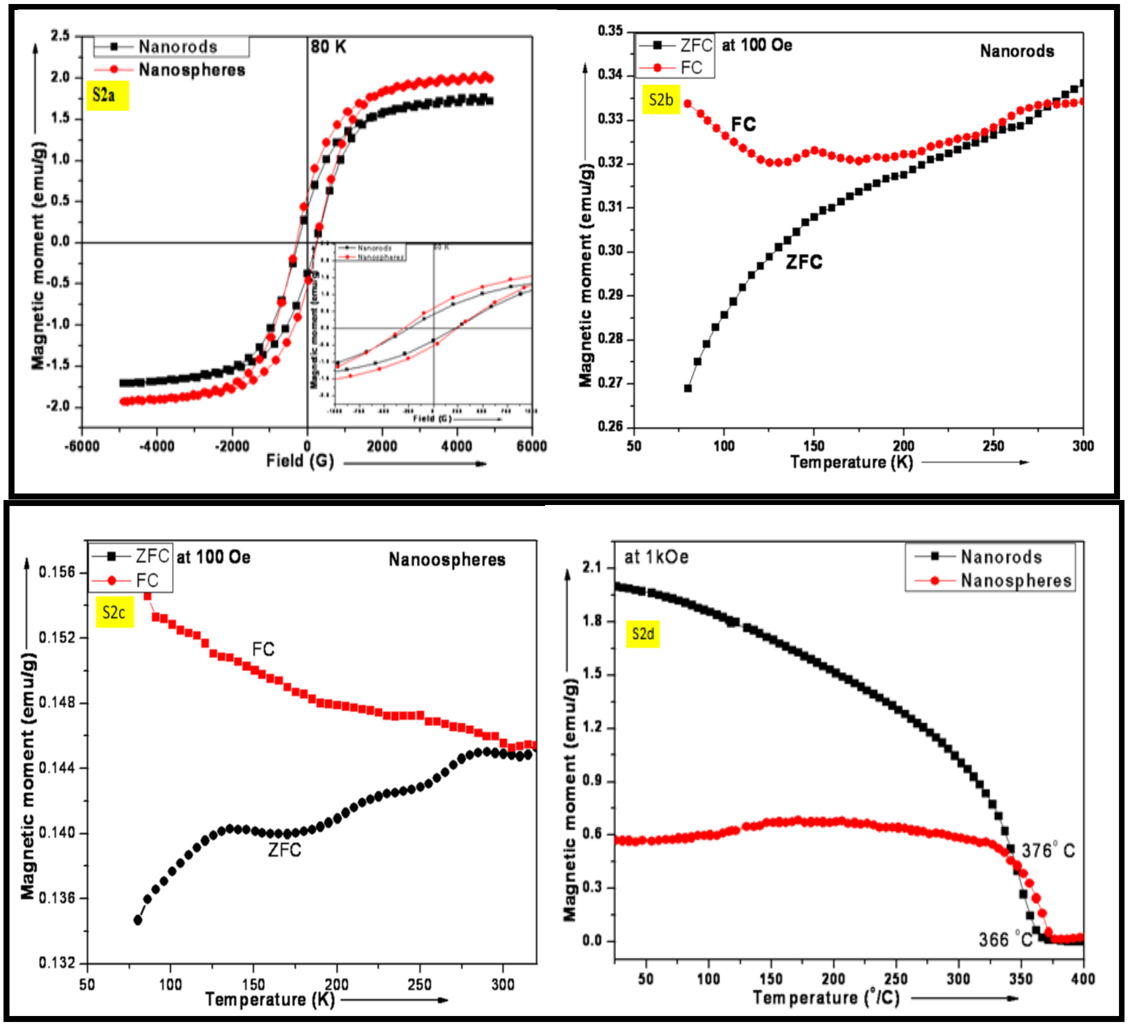

Fig. S2 (a) M/H measurement at 80 K of Ni nanorod and particle (inset) represents coercievity of Ni nanorods and nanospheres at 80 K. (b) ZFC-FC measurement of Ni nanorods at 100 Oe. (c) ZFC-FC measurement of Ni nanosphere at 100 Oe. (d) Ferromagnetic transition temperature of Ni nanorods and sphere at 1K Oe.

Ci (mg/L)	Ce (mg/L)	Qe (mg/g)	Ce/Qe (g/L)	logCe	logqe
20	0.32967	78.68132	0.00419	-0.48192	1.895872
50	6.483516	87.03297	0.074495	0.811811	1.939684
100	38.61852	122.763	0.314578	1.586796	2.089067
200	130.8739	138.2522	0.946632	2.116853	2.140672

Table S1. Experimental data plotted for adsorption isotherms of MB over Ni nanorods and adsorption kinetics followed at different concentration.

Ci (mg/L)	Ce (mg/L)	Qe (mg/g)	Ce/Qe (g/L)	logCe	logqe
20	0.29304	78.82784	0.003717	-0.53307	1.89668
50	3.861852	92.2763	0.041851	0.586796	1.96509
100	31.96756	136.0649	0.234943	1.504709	2.133746
200	90.96808	218.06	0.41717	1.958889	2.338576

Table S2. Experimental data plotted for adsorption isotherms of MB over Ni nanospheres and adsorption kinetics followed at different concentration.

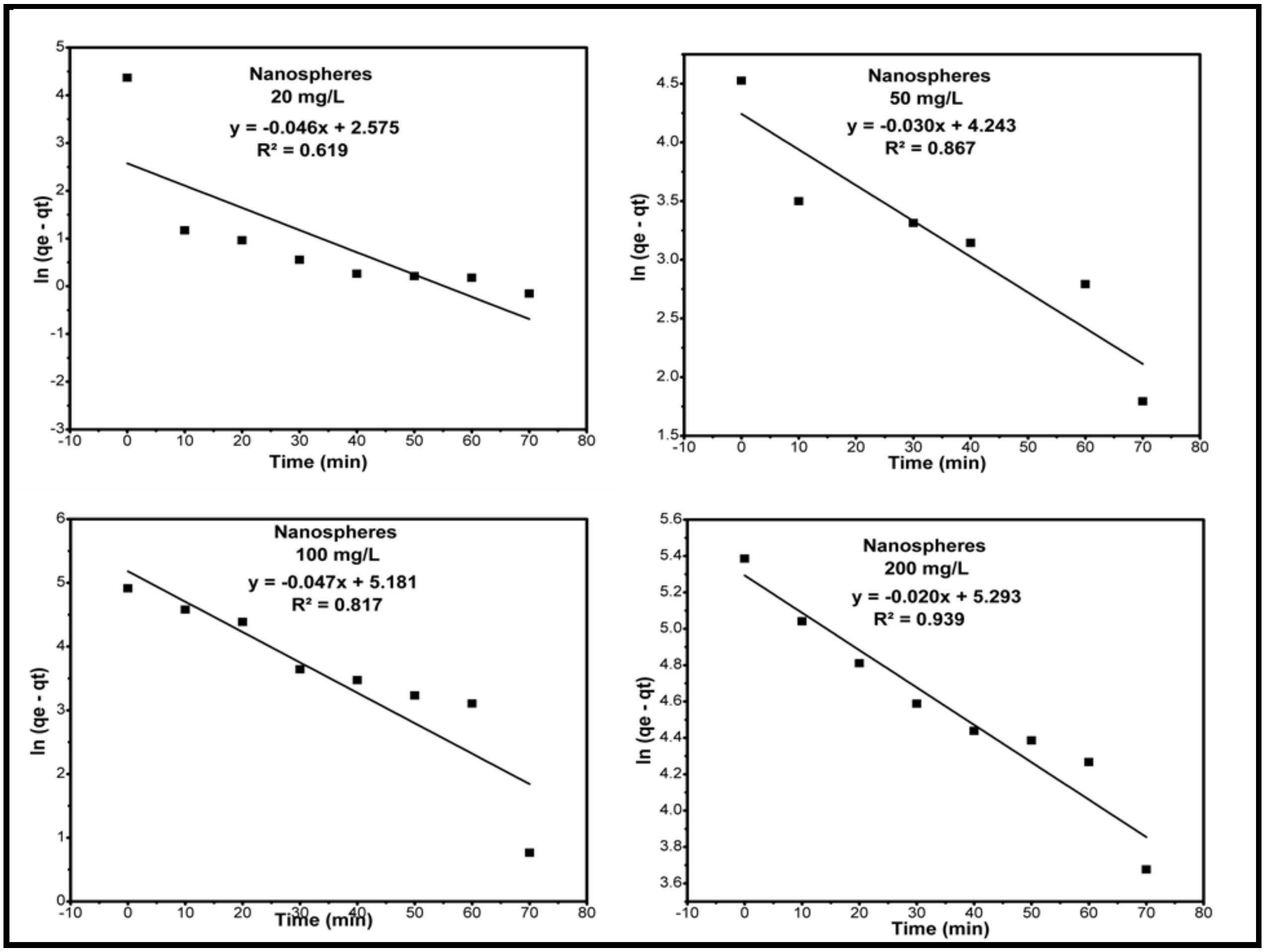

Fig. S3. Psedo first order kinetic plots with their correlation coefficient (R^2) for Ni nanospheres at 20, 50, 100 and 200 mg/L concentration of MB dye.

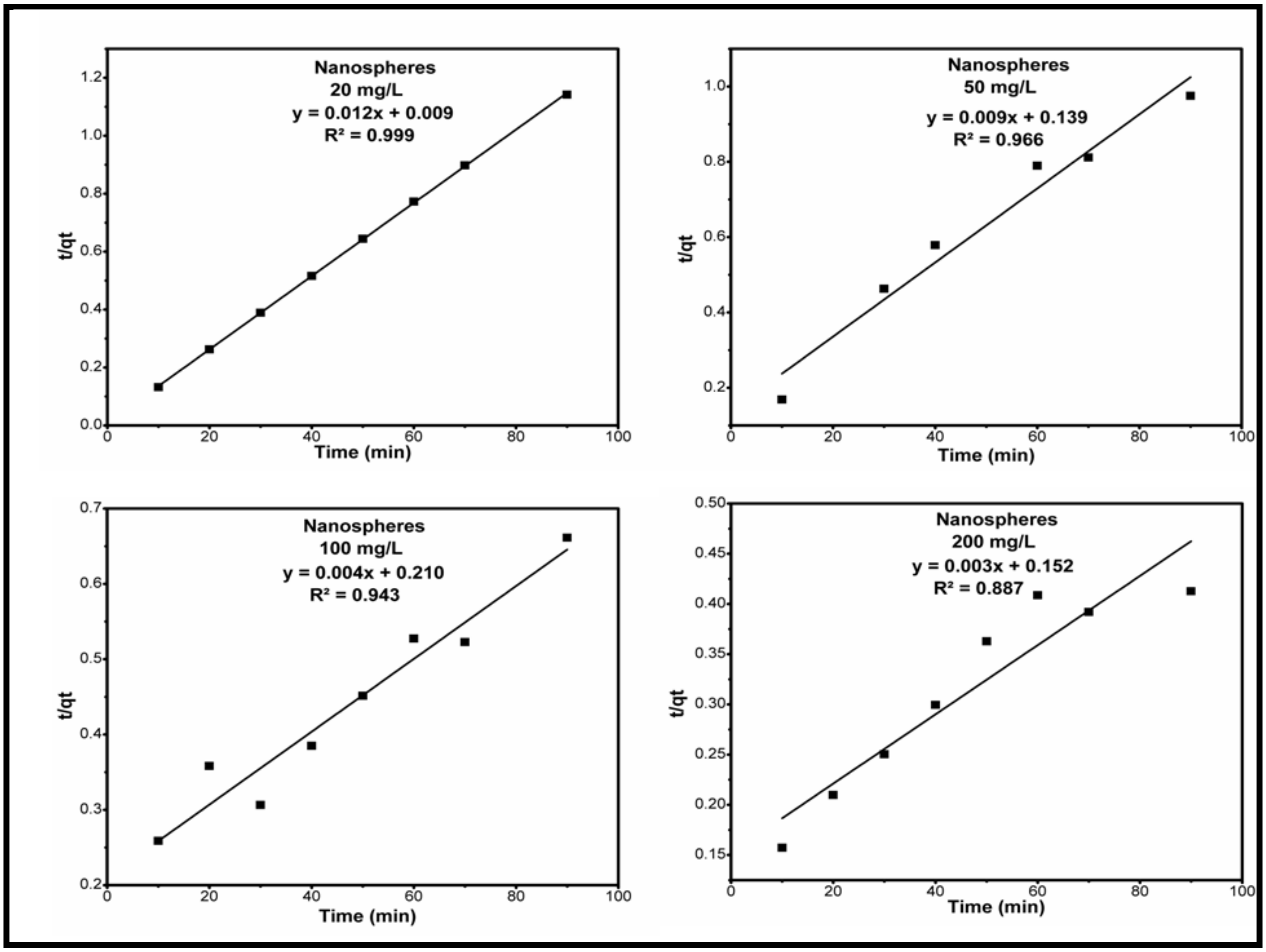

Fig. S4. Pseudo second order kinetic plots with their correlation coefficient (R^2) for Ni nanospheres at 20, 50, 100 and 200 mg/L concentration of MB dye.

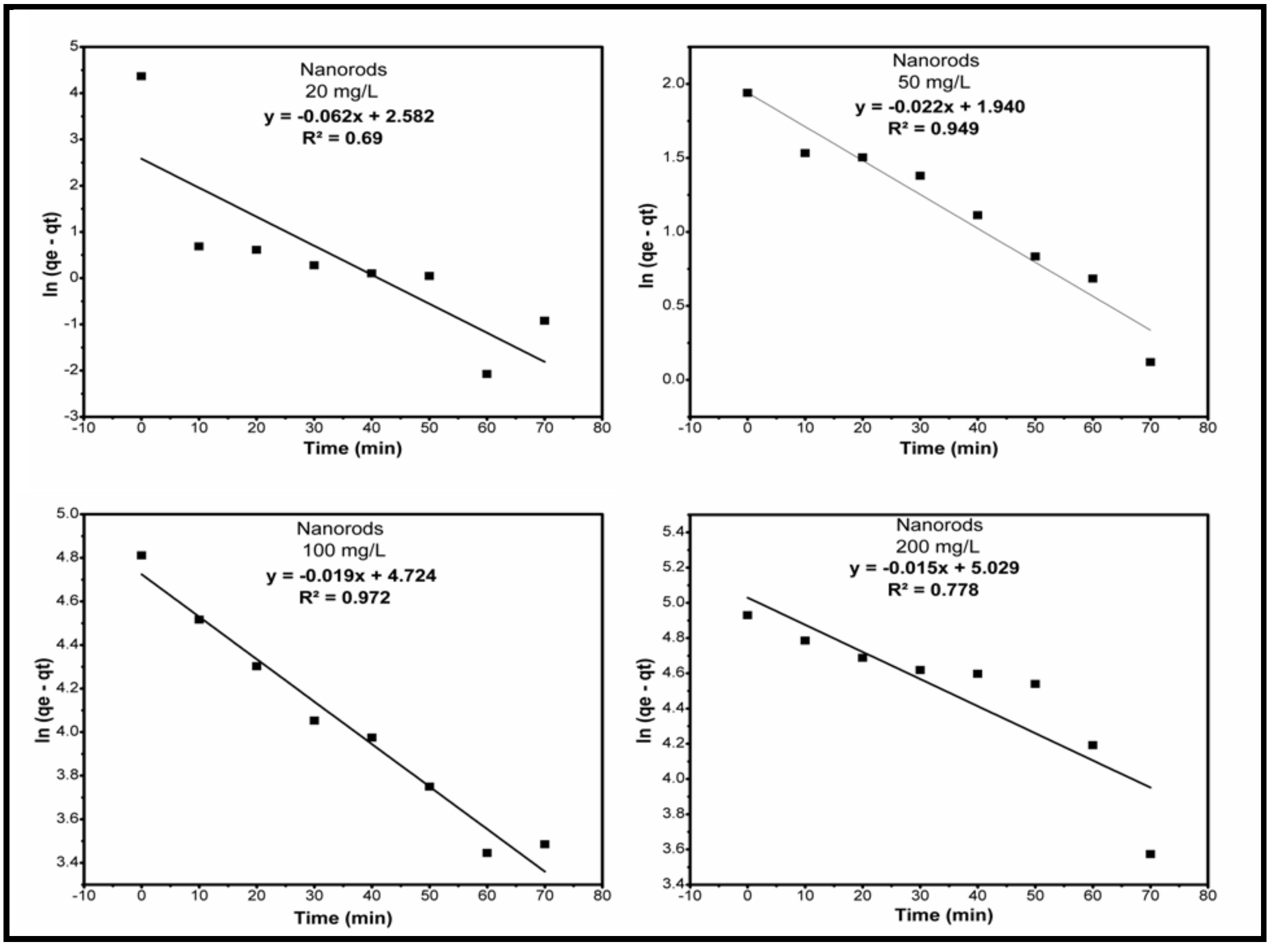

Fig. S5. Pseudo first order kinetic plots with their correlation coefficient (R^2) for Ni nanorods at 20, 50, 100 and 200 mg/L concentration of MB dye.

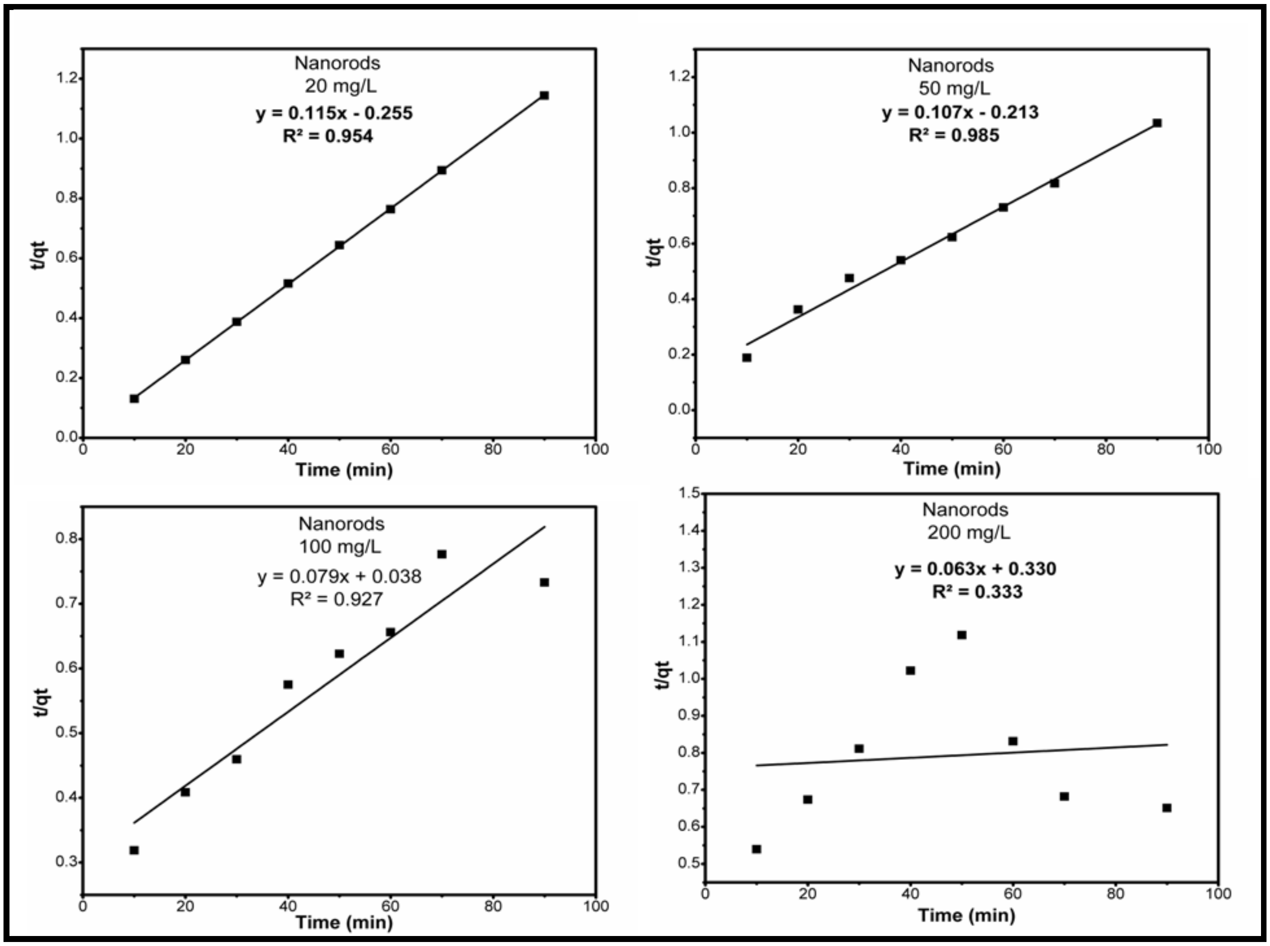

Fig. S6. Pseudo second order kinetic plots with their correlation coefficient (R^2) for Ni nanorods at 20, 50, 100 and 200 mg/L concentration of MB dye.