Electronic Supplementary Material (ESI) for RSC Advances.

Supplementary data

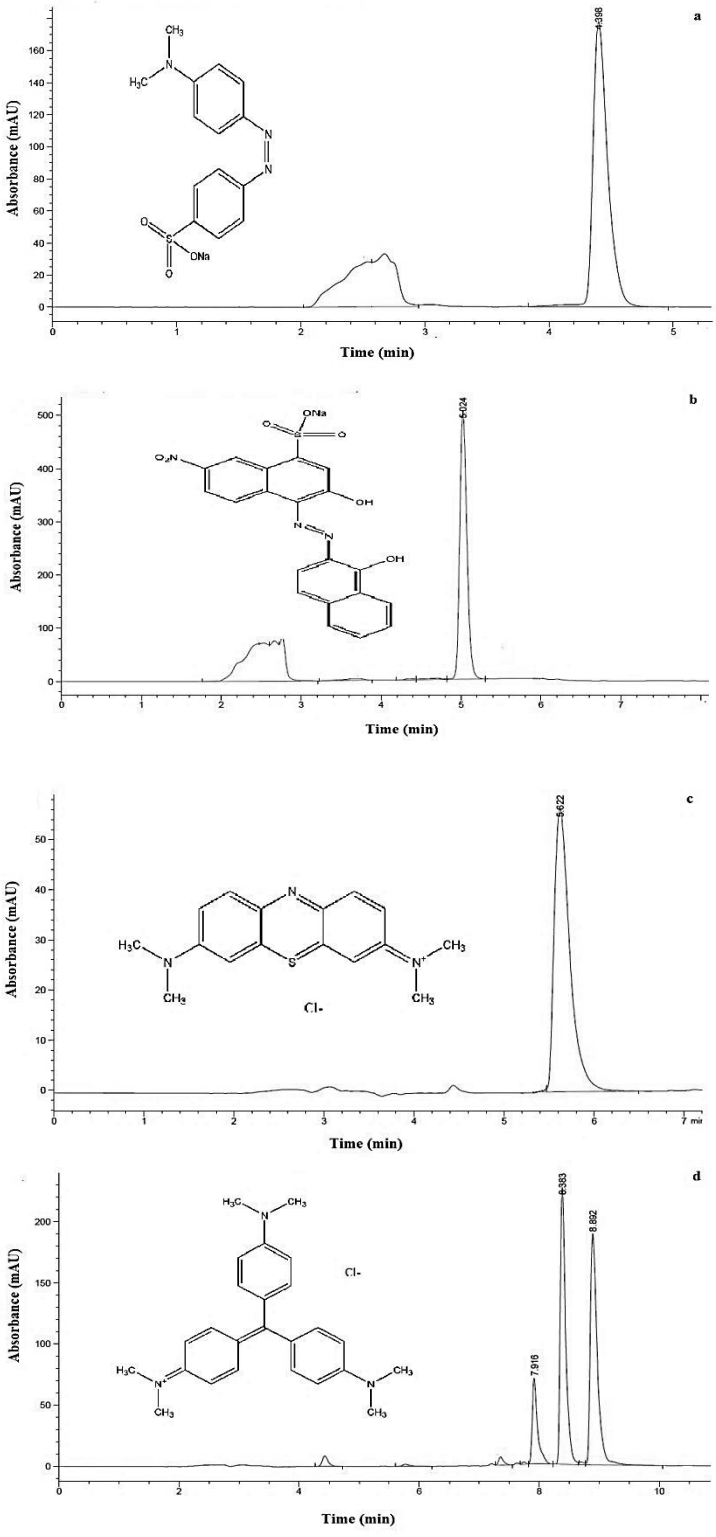

Figure S1: HPLC chromatograms of model dyes: [a] Methyl Orange (MO), [b] Eriochrome Black T (EBT), [c] Methylene Blue (MB) and [d] Crystal Violet (CV)

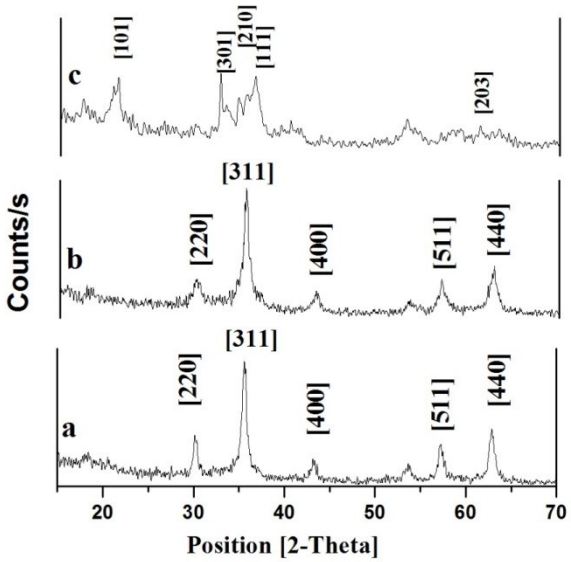

Figure S2: XRD pattern of MP NPs; [a] 0 W/V% pectin, [b] 0.5 W/V% pectin and [c] 1 W/V% pectin

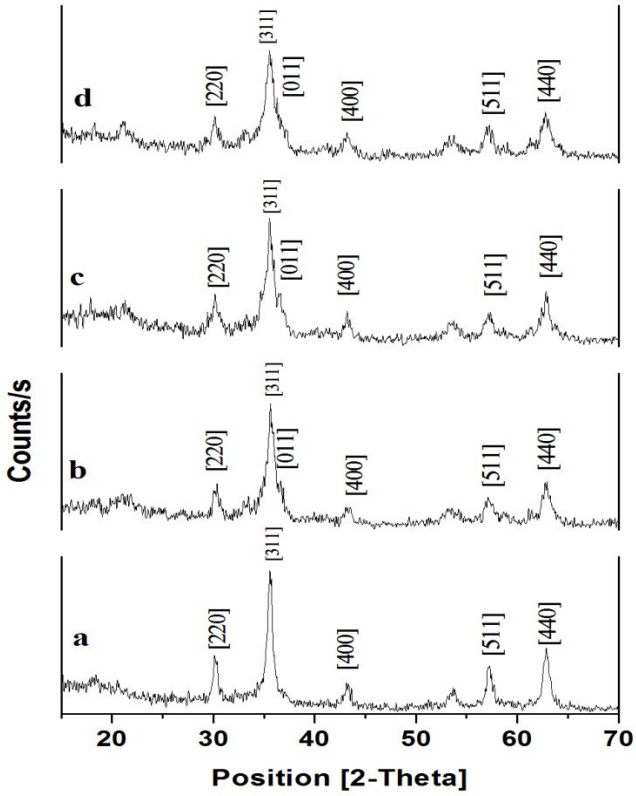

Figure S3: XRD pattern of; [a] pure magnetite, [b] magnetite/silica, [c] magnetite/silica/pectin (0.5 W/V%) NPs and [d] magnetite/silica/pectin (1 W/V%) NPs

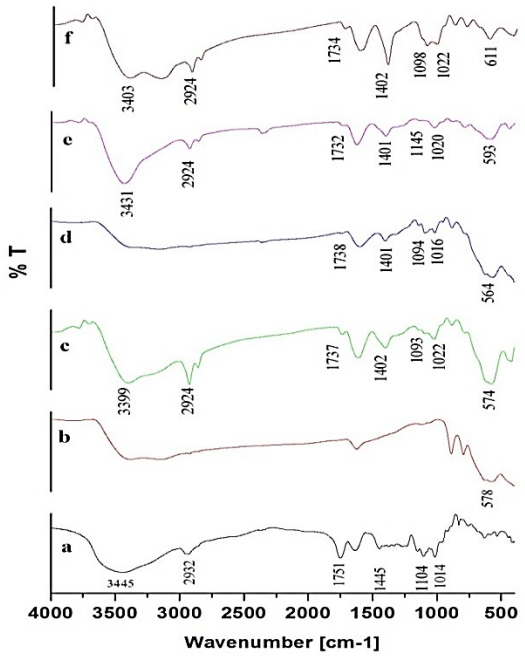

Figure S4: FTIR data for magnetite/pectin NPs; [a] pure pectin, [b] pure magnetite, [c] 0.3 W/V% pectin, [d] 0.5 W/V% pectin, [e] 0.7 W/V% pectin and [f] 1 W/V% pectin

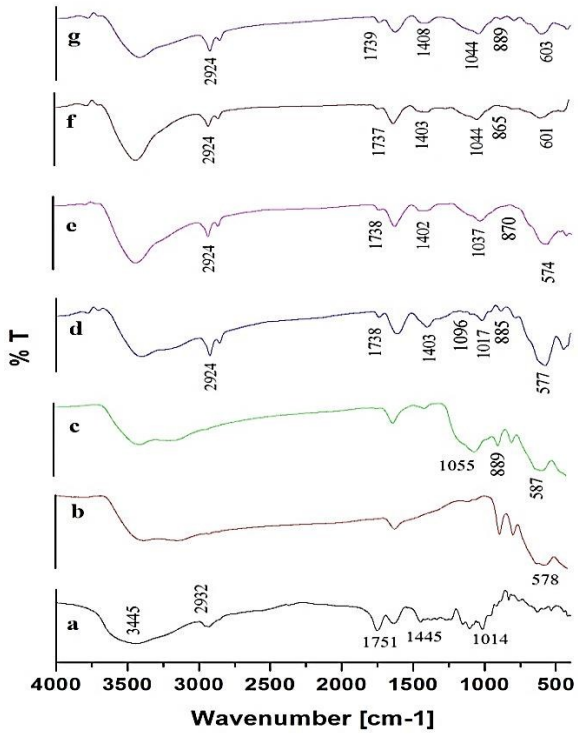

Figure S5: FTIR data for magnetite/silica/pectin NPs; [a] pure pectin, [b] pure magnetite, [c] magnetite silica , [d] 0.3 W/V% pectin, [e] 0.5 W/V % pectin, [f] 0.7 W/V% pectin and [g] 1 W/V% pectin

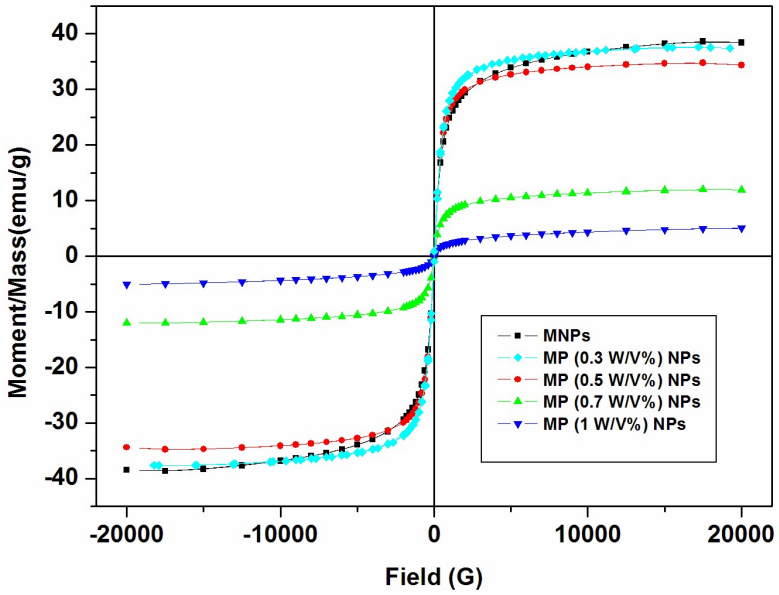

Figure S6: Hysteresis loop of magnetite/pectin NPs

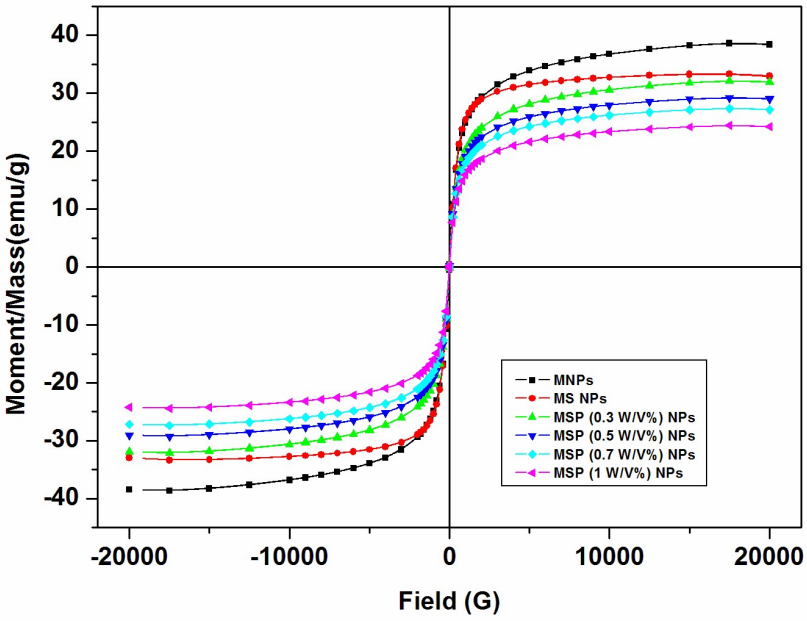

Figure S7: Hysteresis loop of magnetite/silica/pectin NPs

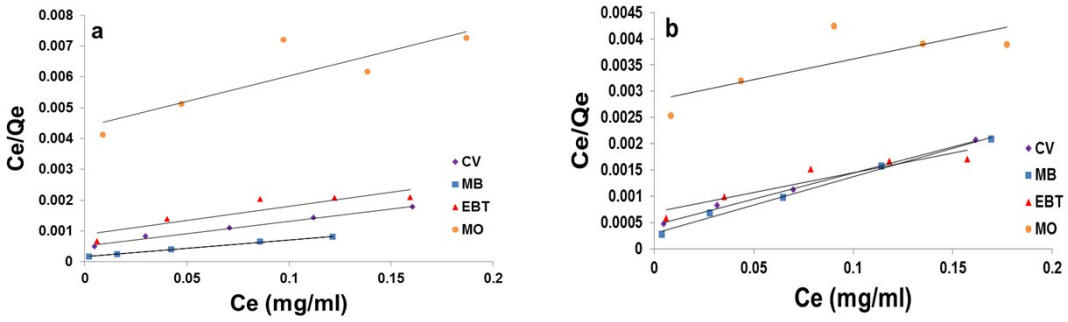

Figure S8: Fitting of isotherm data to Langmuir model for; [a] MSP NPs and [b] MP NPs. Adsorbent: 2 g/L, Dyes 10-200 mg/L, Temperature: 25◦C, pH: 2.0 for anionic dyes and 8.0 for cationic dyes Time:120 min. Magnetite/Pectin Nanoparticles: MP NPs and Magnetite/Silica/Pectin Nanoparticles: MSP NPs

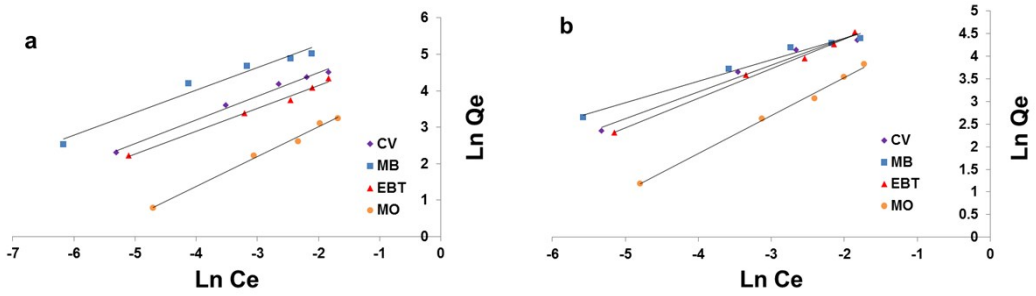

Figure S9: Fitting of isotherm data to Freundlich model for; [a] MSP NPs and [b] MP NPs. Adsorbent: 2 g/L, Dyes 10-200 mg/L, Temperature: 25◦C, pH: 2.0 for anionic dyes and 8.0 for cationic dyes Time:120 min. Magnetite/Pectin Nanoparticles: MP NPs and Magnetite/Silica/Pectin Nanoparticles: MSP NPs

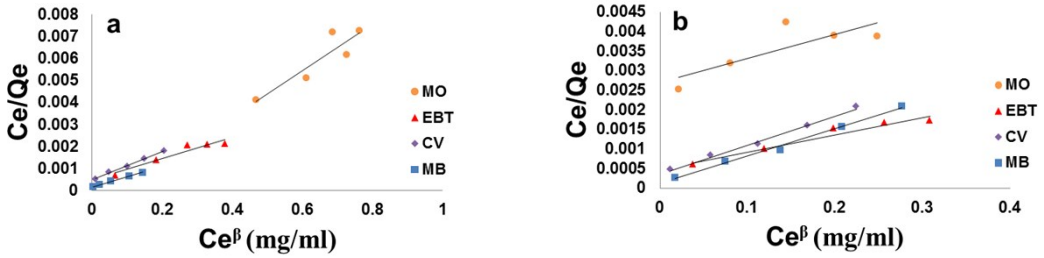

Figure S10: Fitting of isotherm data to Redlich-Peterson model for; [a] MSP NPs and [b] MP NPs. Adsorbent: 2 g/L, Dyes 10-200 mg/L, Temperature: 25◦C, pH: 2.0 for anionic dyes and 8.0 for cationic dyes Time:120 min. Magnetite/Pectin Nanoparticles: MP NPs and Magnetite/Silica/Pectin Nanoparticles: MSP NPs

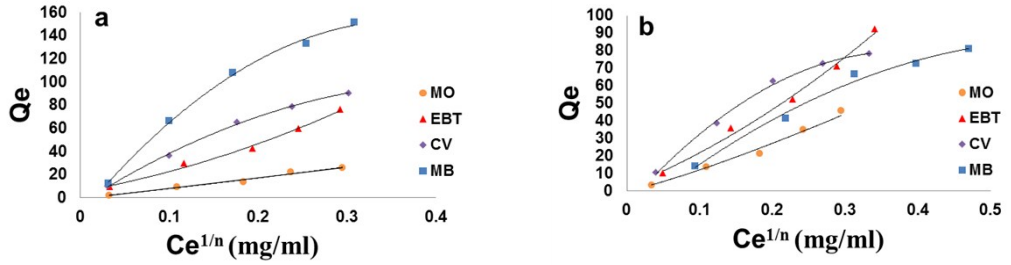

Figure S11: Fitting of isotherm data to Sips model for; [a] MSP NPs and [b] MP NPs. Adsorbent: 2 g/L, Dyes 10-200 mg/L, Temperature: 25◦C, pH: 2.0 for anionic dyes and 8.0 for cationic dyes Time:120 min. Magnetite/Pectin Nanoparticles: MP NPs and Magnetite/Silica/Pectin Nanoparticles: MSP NPs

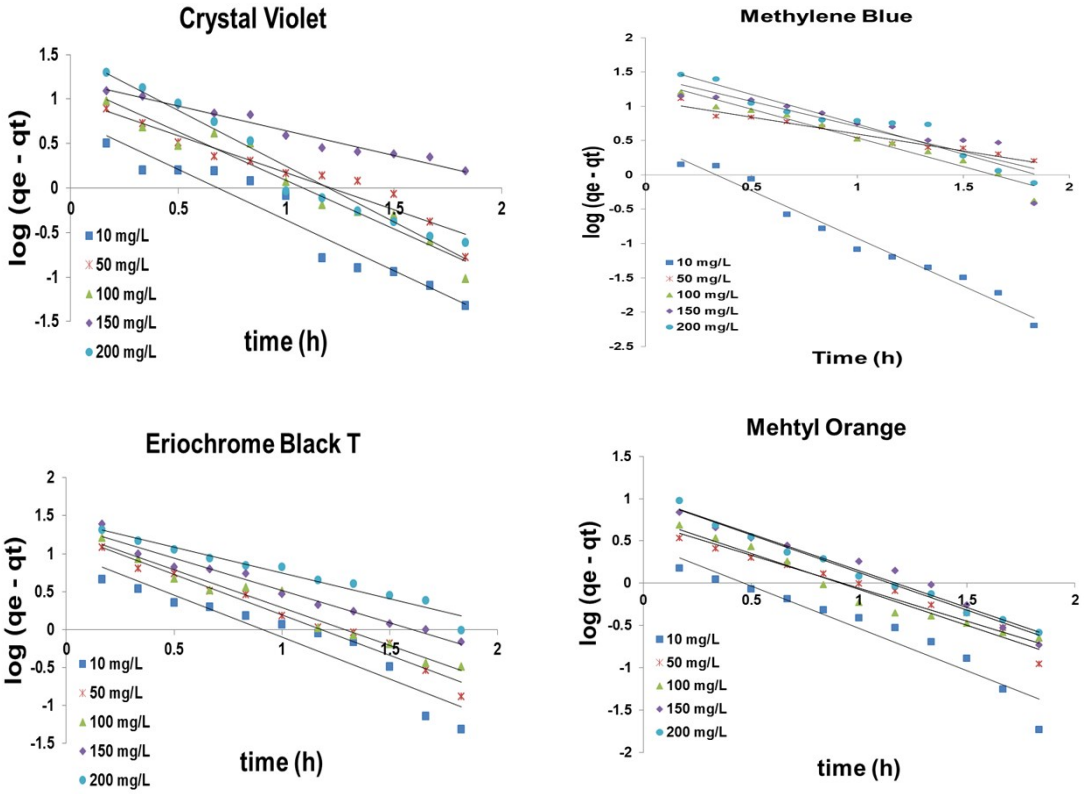

Figure S12: Fitting of kinetic data to pseudo first order kinetic model for Magnetite/Silica/pectin |(MSP) NPs. Adsorbent: 2 g/L, Dyes 10-200 mg/L, Temperature: 25◦C, pH: 2.0 for anionic dyes and 8.0 for cationic dyes Time:120 min.

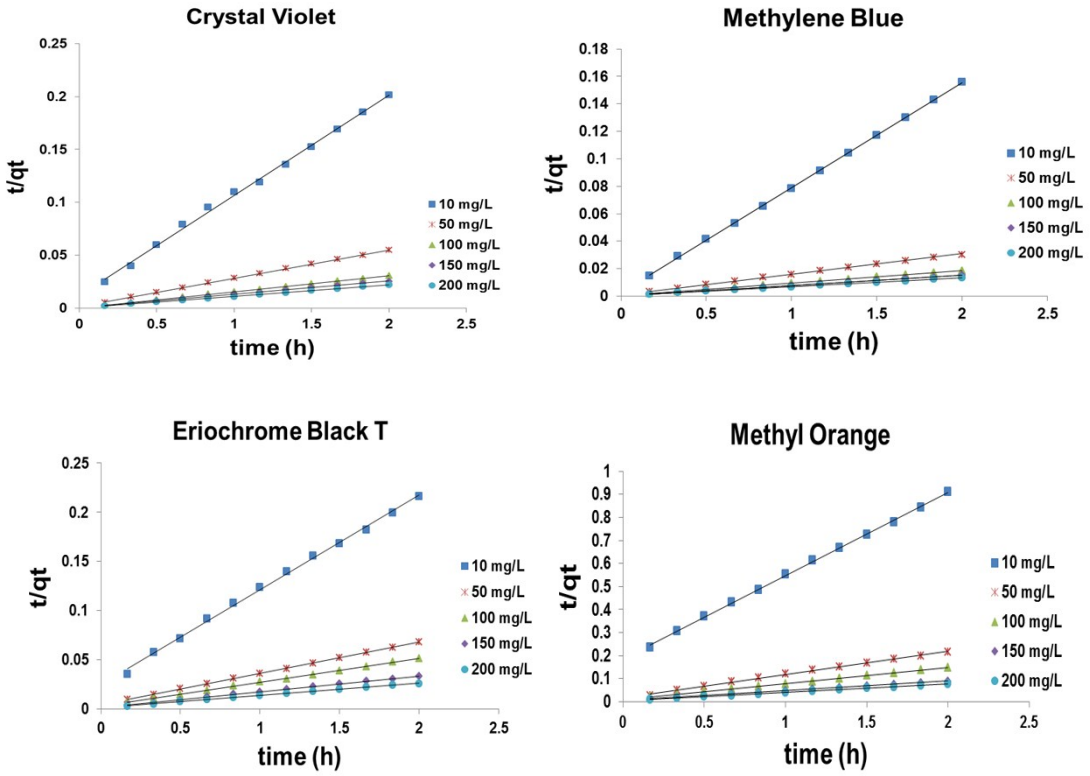

Figure S13: Fitting of kinetic data to pseudo second order kinetic model for Magnetite/Silica/pectin |(MSP) NPs. Adsorbent: 2 g/L, Dyes 10-200 mg/L, Temperature: 25◦C, pH: 2.0 for anionic dyes and 8.0 for cationic dyes Time:120 min

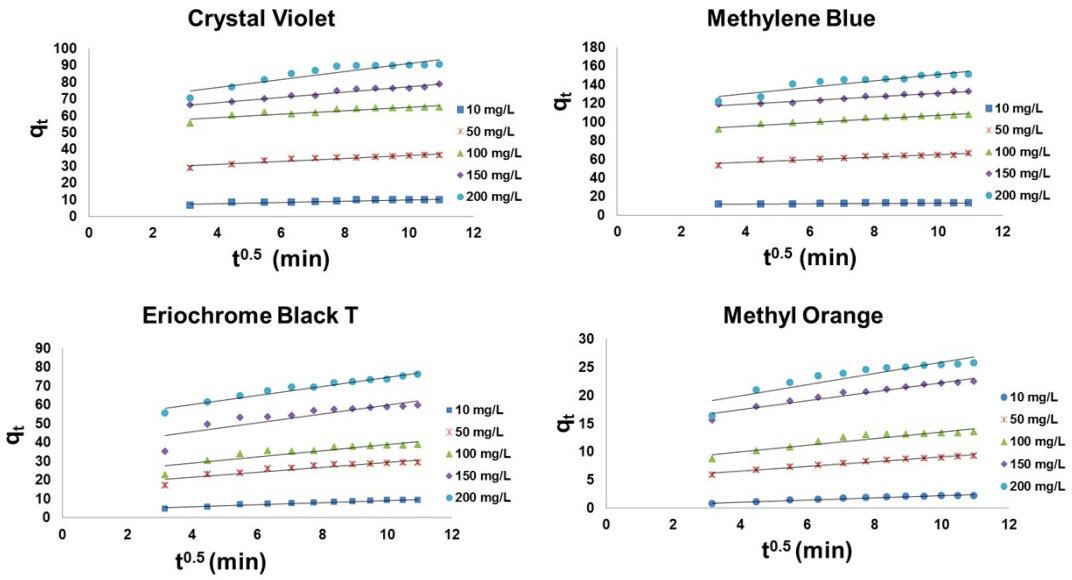

Figure S14: Fitting of kinetic data to intraparticle diffusion model for Magnetite/Silica/pectin |(MSP) NPs. Adsorbent: 2 g/L, Dyes 10-200 mg/L, Temperature: 25◦C, pH: 2.0 for anionic dyes and 8.0 for cationic dyes Time:120 min

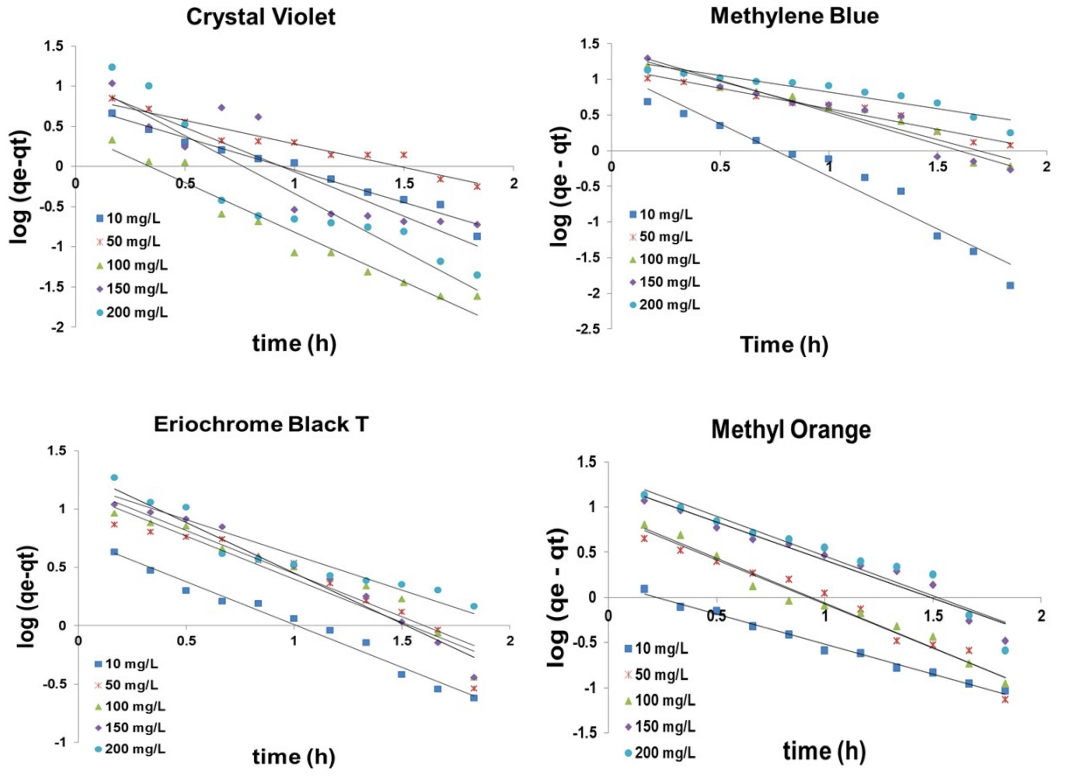

Figure S15: Fitting of kinetic data to pseudo first order kinetic model for magnetite/pectin (MP) NPs. Adsorbent: 2 g/L, Dyes 10-200 mg/L, Temperature: 25◦C, pH: 2.0 for anionic dyes and 8.0 for cationic dyes Time:120 min

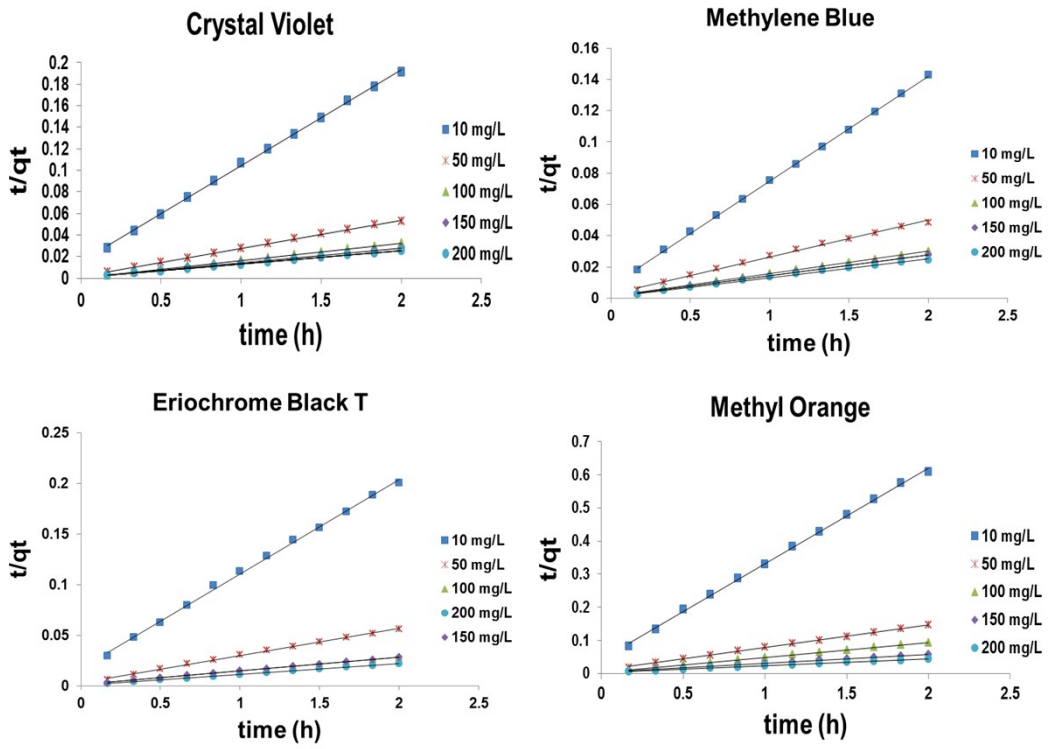

Figure S16: Fitting of kinetic data to pseudo second order kinetic model for magnetite/pectin (MP) NPs. Adsorbent: 2 g/L, Dyes 10-200 mg/L, Temperature: 25◦C, pH: 2.0 for anionic dyes and 8.0 for cationic dyes Time:120 min

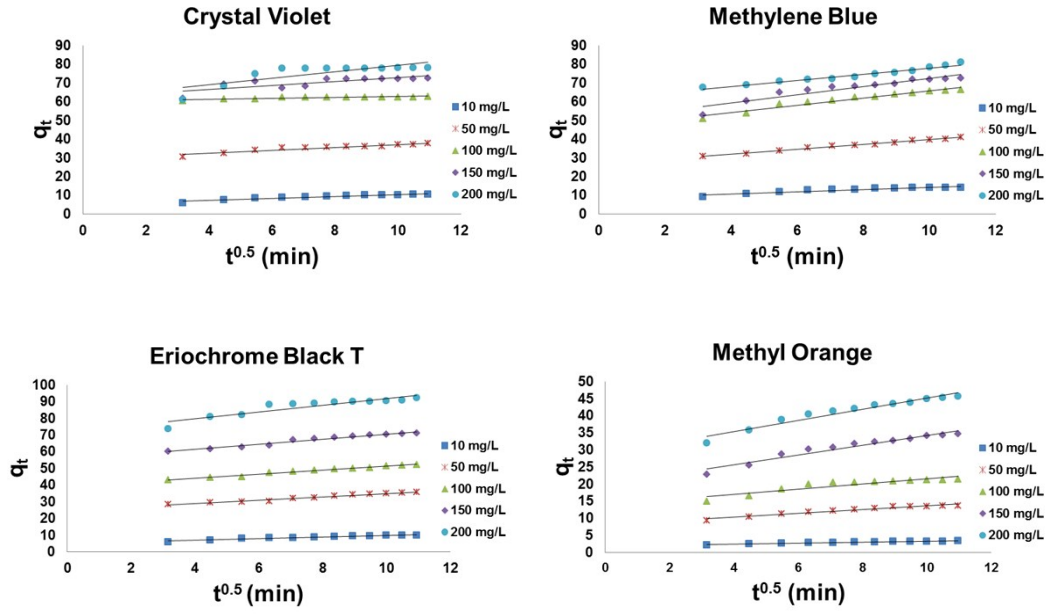

Figure S17: Fitting of kinetic data to intraparticle diffusion model for magnetite/pectin (MP) NPs. Adsorbent: 2 g/L, Dyes 10-200 mg/L, Temperature: 25◦C, pH: 2.0 for anionic dyes and 8.0 for cationic dyes Time:120 min