Simultaneously catalytic degradation/reduction of multiple organic compounds by modifiable p(Methacrylic acid-co-Acrylonitrile)-M (M:Cu, Co) microgel catalyst composites

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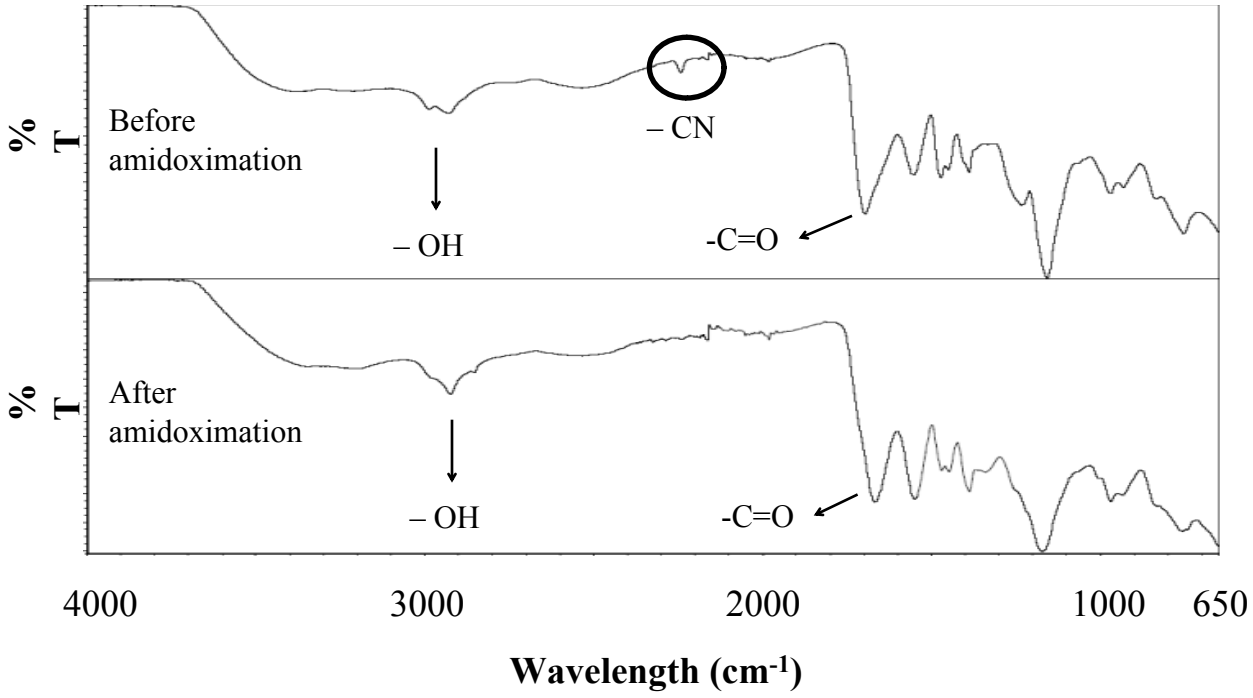


Fig. S1. FT-IR spectra of p(MAc-co-AN) microgels before and after amidoximation.

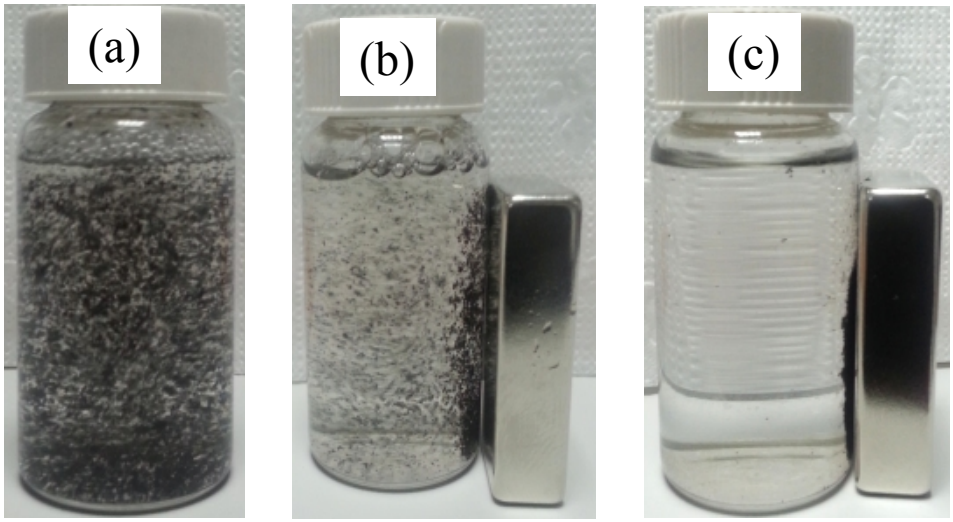


Fig. S2. Amid-p(MAc-co-AN)-Co composites (a) in the absence of external magnetic field and (b) movement of magnetic nanoparticles towards externally applied magnetic field (c) attraction of all nanoparticles towards externally applied magnetic field.

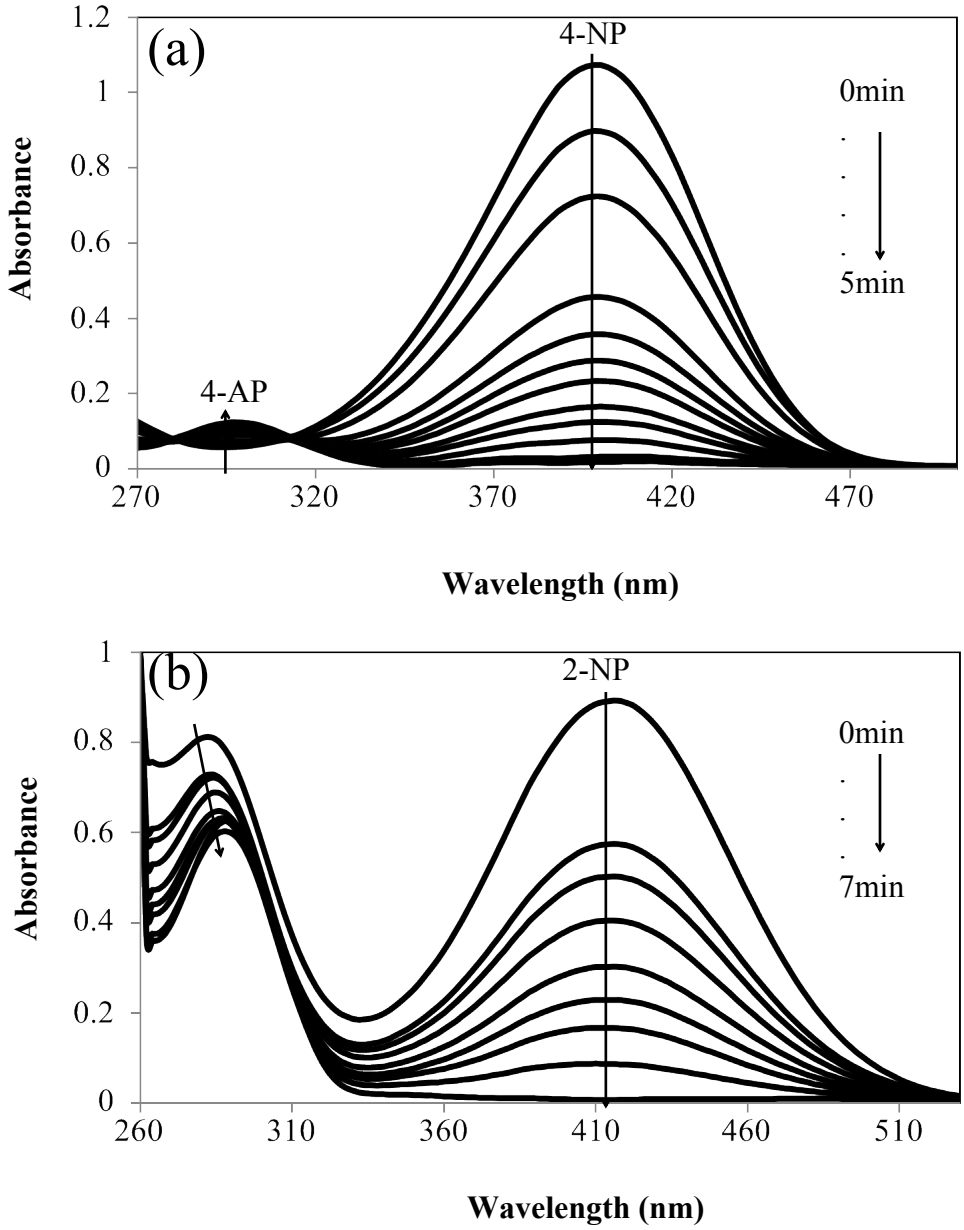


Fig. S3. UV-Vis spectra for the reduction of (a) 4-NP and (b) 2-NP in the presence of amid-p(MAc-co-AN)-Cu composites. Reaction conditions; 0.01 M 2-NP or 4-NP = 100 mL, $NaBH_4$ = 1.89g, catalyst = 0.045 mmoles, 30 °C, 600 rpm.

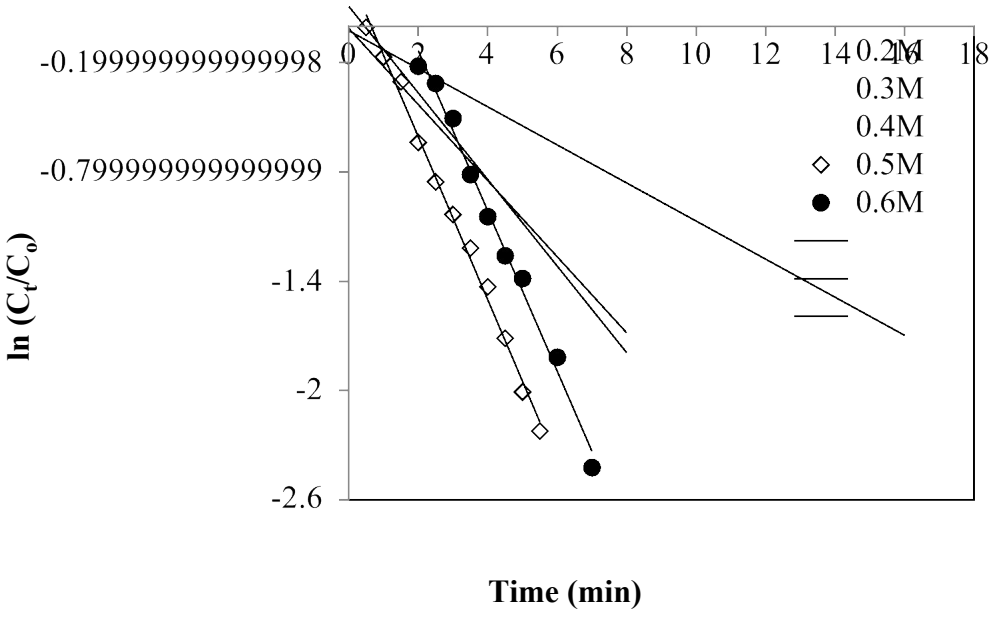


Fig. S4. Plots of $\ln(C_t/C_o)$ as a function of time for the reduction of 4-NP catalyzed by amid-p(MAc-co-AN)-Cu composites with different amounts of $NaBH_4$. Reaction conditions; 0.01 M 4-NP = 100 mL, catalyst = 0.045 mmoles of Cu, 30 °C and 600 rpm.

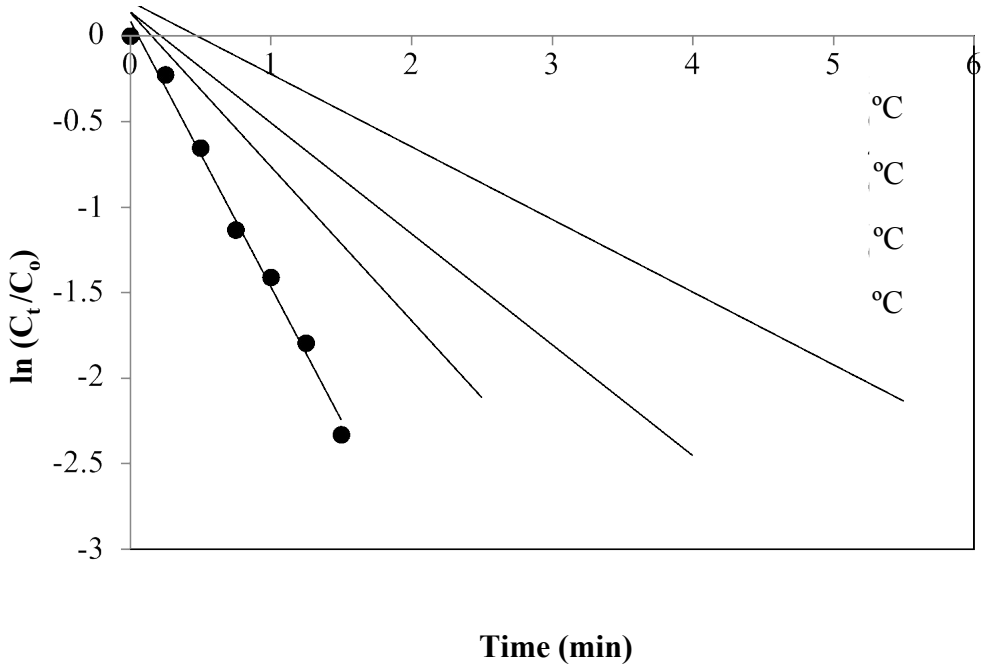


Fig. S5. (a) Plots of ln (C_t/C_o) vs. time for the reduction of 4-NP catalyzed by amid-p(MAc-co-AN)-Cu composites at different temperatures. Reaction conditions; 0.01 M 4-NP = 100 mL, $NaBH_4$ = 1.89g, catalyst = 0.045 mmoles of Cu or Co, 30 °C, 600 rpm.

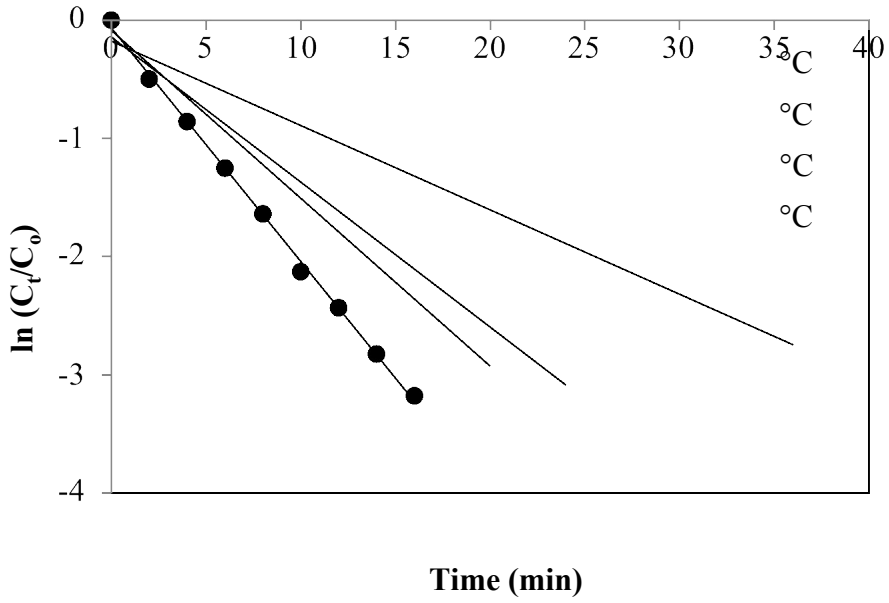


Fig. S6. Plots of $\ln(C_t/C_o)$ as a function of time for the reduction of 4-NP catalyzed by amid- p(MAc-co-AN)-Co composites at different temperatures. Reaction conditions; 0.01 M 4-NP = 100 mL, $NaBH_4$ = 1.89 g, catalyst = 0.045 mmoles of Co, and 600 rpm.

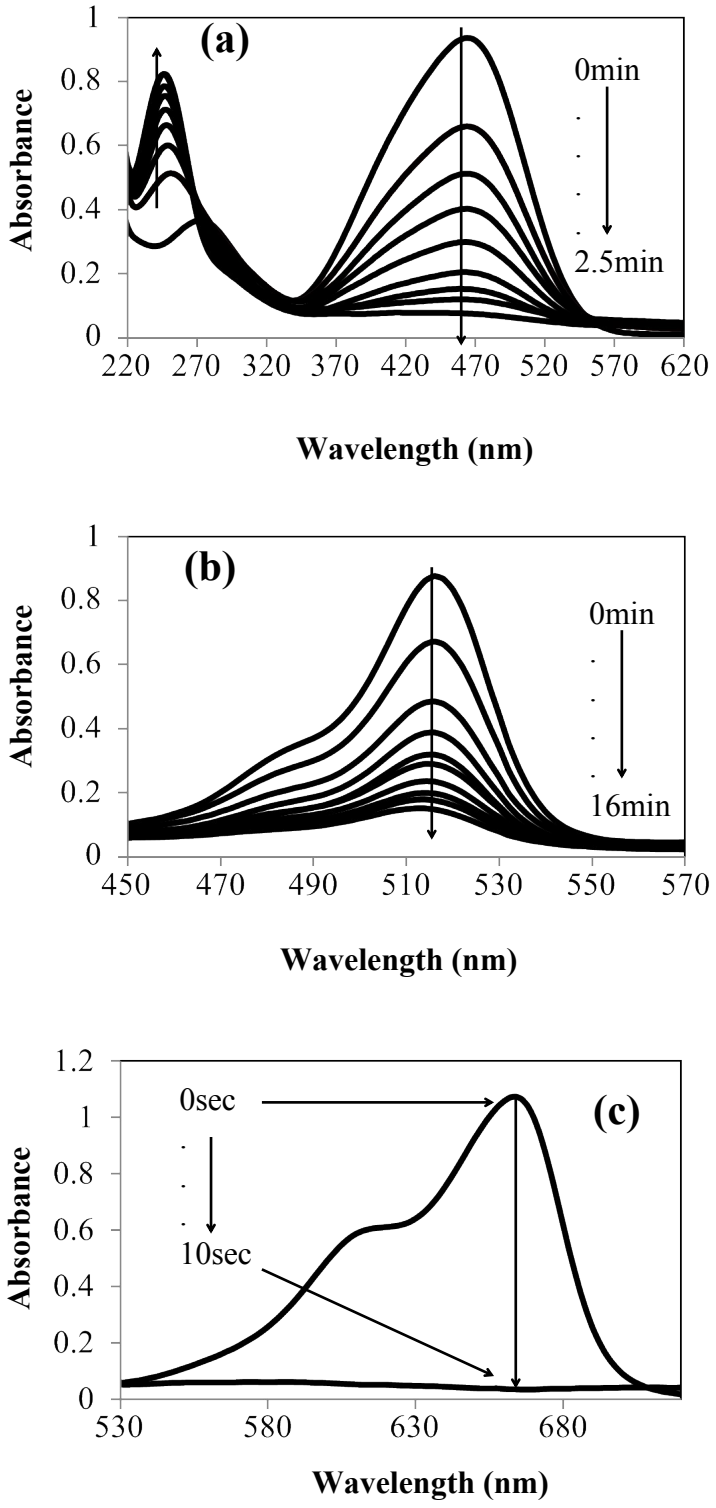
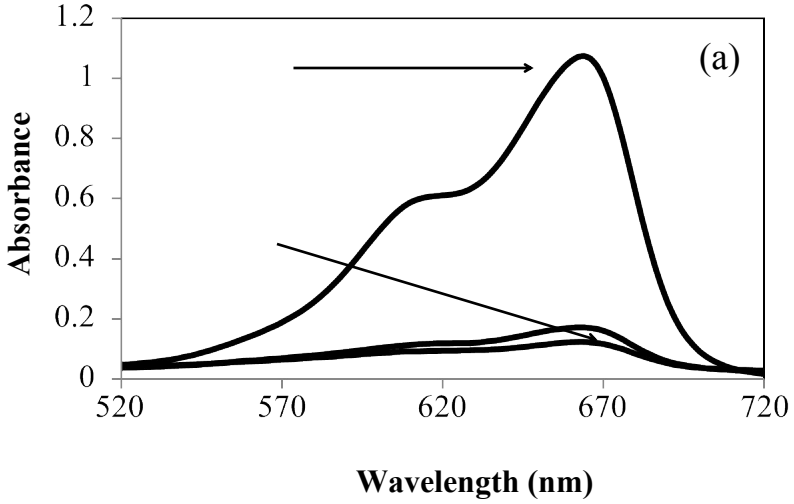


Fig. S7. UV-Vis spectra representing degradation of (a) MO, (b) EY and (c) MB in the presence of amid-p(MAc-co-AN)-Cu catalyst. Solution = 100 mL (MO = 4 x 10^{-4} M, EY = 4 x 10^{-5} M, and MB = 1.6 x 10^{-4} M), $NaBH_4$ = 0.075g, catalyst = 0.045 mmoles, 30 ºC, 600 rpm.



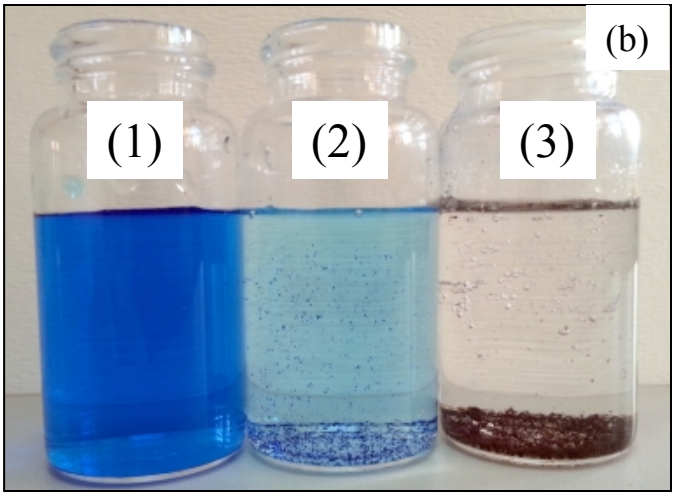


Fig. S8. (a) UV-Vis spectra for the absorption of MB by amid-p(MAc-co-AN)-Cu composites. Reaction conditions; 1.6 x 10^{-4} M solution of MB = 100 mL, catalyst = 0.045 mmoles, 30 ºC, 600 rpm. (b) Digital camera images of MB solution (1) original solution, (2) after absorption by amid-p(MAc-co-AN)-Cu composites and (3) after reduction in the presence of $NaBH_4$ and amid-p(MAc-co-AN)-Cu composites.

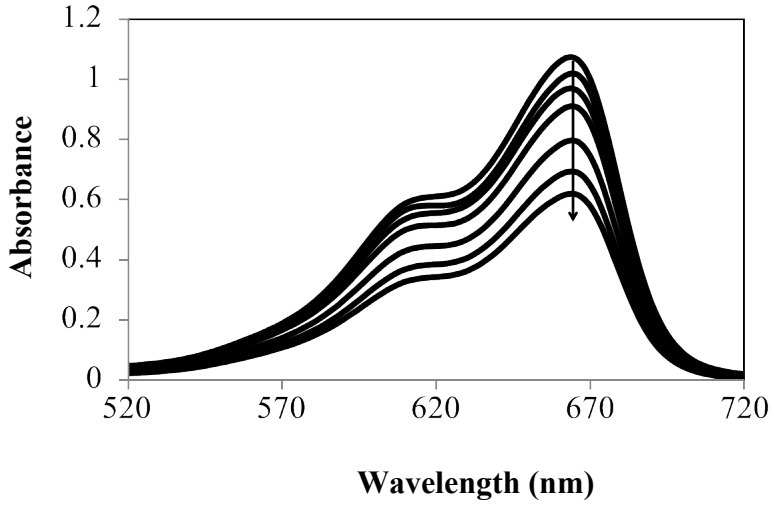


Fig. S9. UV-Vis spectra recorded for the degradation of MB by $NaBH_4$. Reaction conditions; 1.6 x 10^{-4} M solution of MB = 100 mL, $NaBH_4$ = 0.075g, 30 ºC, 600 rpm.

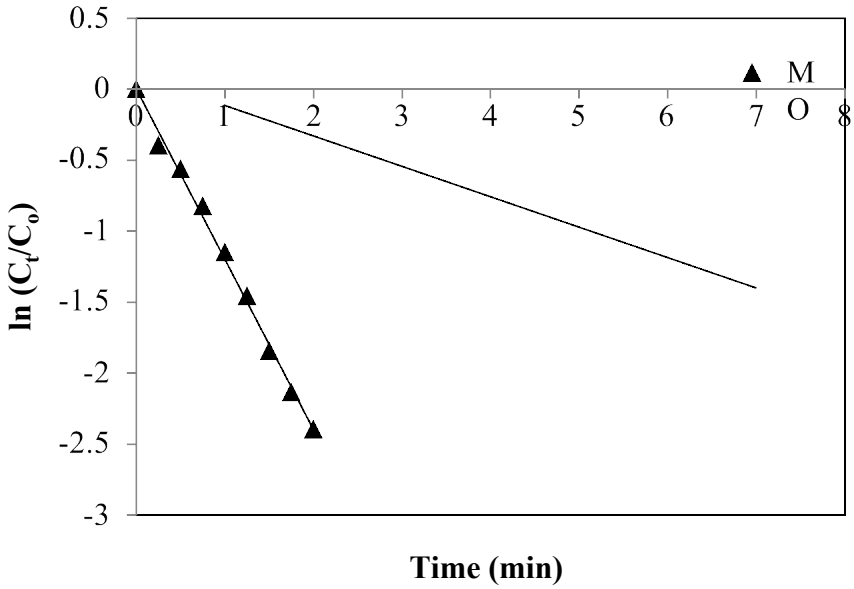


Fig. S10. Plots of $\ln(C_t/C_o)$ as a function of time for the reduction of EY and MO catalyzed by amid-p(MAc-co-AN)-Cu composites. Reaction conditions; solution = 100 mL, (EY 4 x 10^{-4} M, MO 4 x 10^{-5} M) $NaBH_4$ = 0.075g, amount of catalyst = 0.045 mmoles, 30 ºC, 600 rpm.