Electronic Supplementary Material (ESI) for Materials Chemistry Frontiers.

In-situ hydroxyl radical generation using the synergism of Co-Ni bimetallic centres of developed nanocatalyst with potent efficiency of degrading toxic water pollutants

Rakesh K. Sharma*, Bhavya Arora, Shivani Sharma,Sriparna Dutta, Aditi Sharma, Sneha Yadav and Kanika Solanki

Green Chemistry Network Centre, Department of Chemistry, University of Delhi, NewDelhi-110007, India. Fax: +91-011-27666250; Tel: 011-276666250

Email:rksharmagreenchem@hotmail.com

Supporting Information

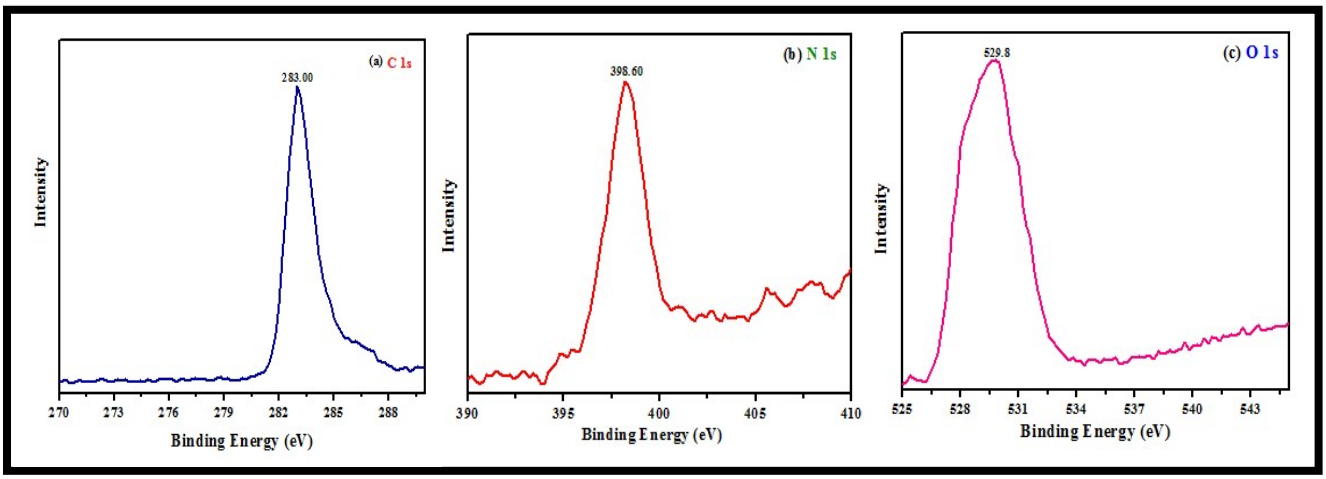

Fig. S1 Core level spectra of (a) C 1s (b) N 1s (c) O 1s of Co-Ni@CS@Fe_3O_4

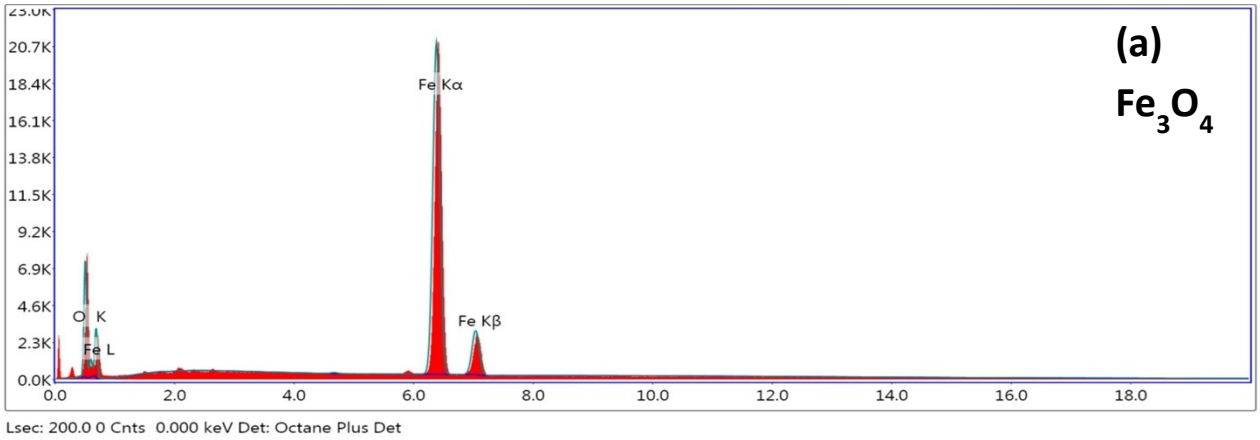

Fig. S2 EDS spectra of Fe_3O_4.

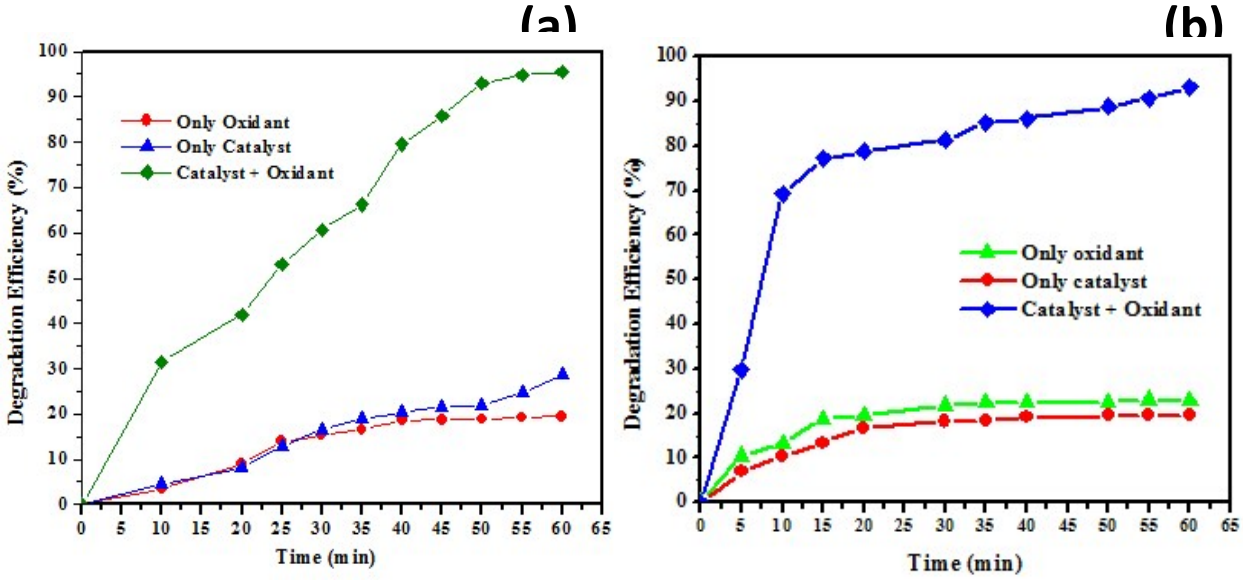

Fig. S3 Graph plot of degradation efficiency (%) as a function of time (min) **(a)** 2,4-D (reaction conditions : 50 mL stock solution (100 mg/L), 1 mL H_2O_2, 10 mg catalyst, pH = 7, 60 min, r.t., λ_{max} = 284 nm) **(b)** MO (reaction conditions : 50 mL stock solution (10 mg/L), 2 mL H_2O_2, 20 mg catalyst, pH = 7, 60 min, r.t., λ_{max} = 465 nm).

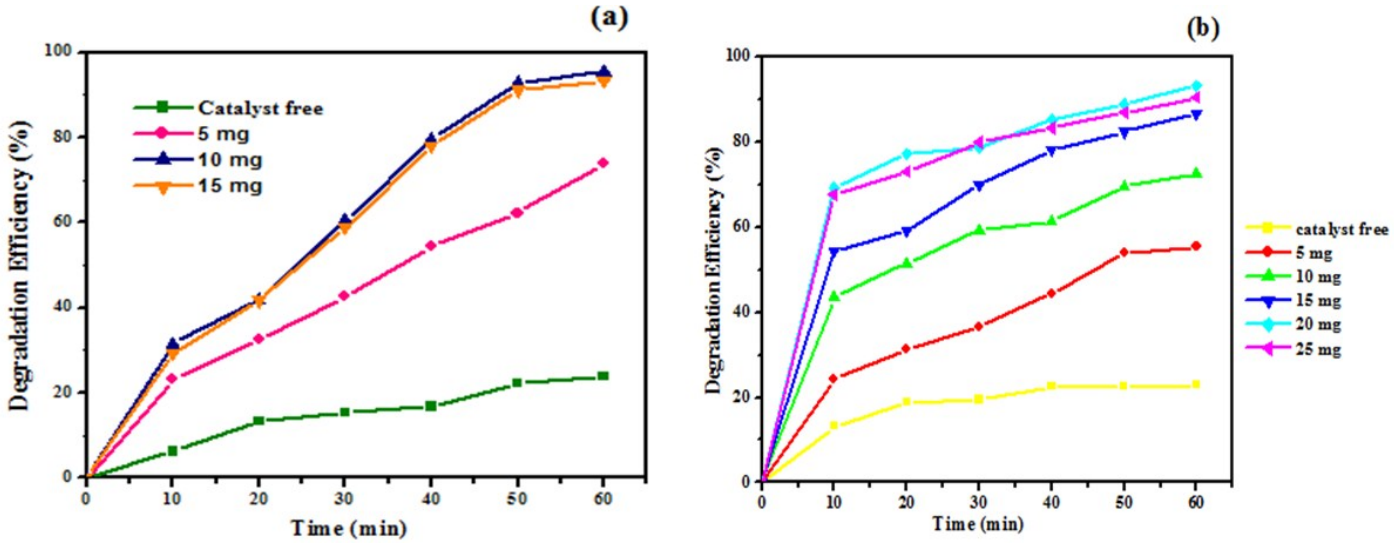

Fig. S4 Effect of catalyst dosage on the catalytic degradation of (a) 2,4-D (reaction conditions : 50 mL stock solution (100 mg/L), x mg catalyst 1 mL H_2O_2, pH = 7, 60 min, r.t., λ_{max} = 284 nm) (b) MO (reaction conditions : 50 mL stock solution (10 mg/L), x mg catalyst, 2 mL H_2O_2, pH = 7, 60 min, r.t., λ_{max}= 465 nm).

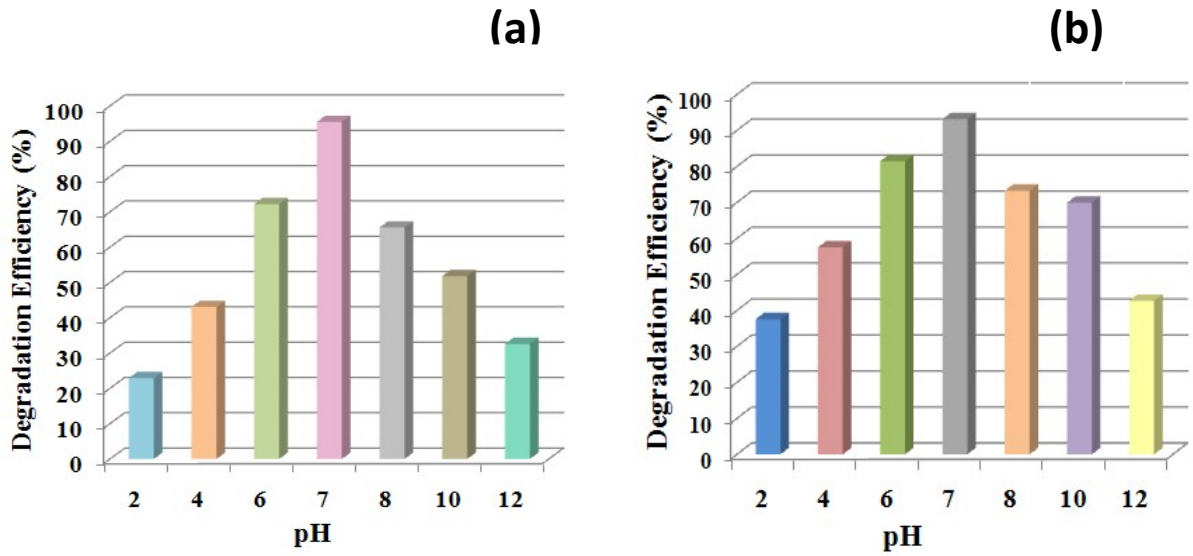

Fig. S5 Effect of pH on the catalytic degradation of (a) 2,4-D (reaction conditions : 50 mL stock solution (100 mg/L), 10 mg catalyst, 1 mL H_2O_2, 60 min, r.t., λ_{max} = 284 nm) (b) MO (reaction

conditions : 50 mL stock solution (10 mg/L), 10 mg catalyst, 2 mL H_2O_2, 60 min, r.t., λ_{max} = 465 nm).

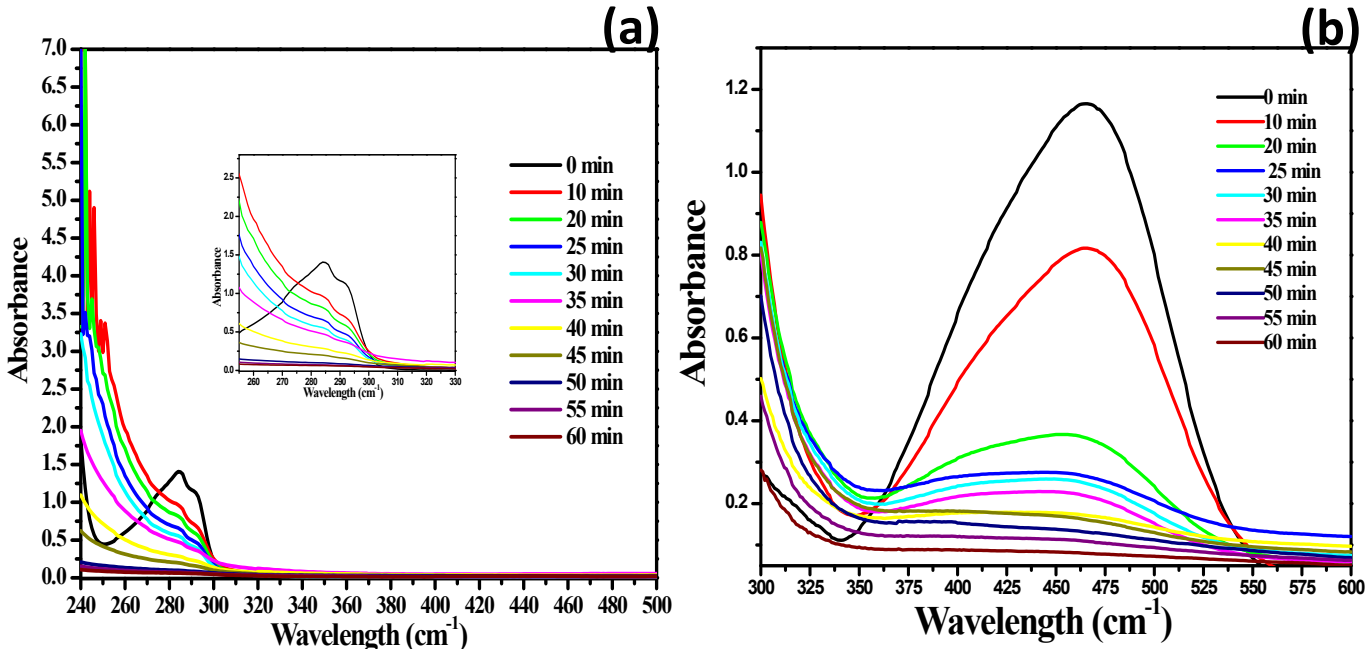

Fig. S6(a) UV-Vis plot of degradation of 2,4-D under optimized conditions (reaction conditions : 50 mL stock solution (100 mg/L), 1 mL H_2O_2, 10 mg catalyst, pH = 7, 60 min, r.t., λ_{max} = 284 nm) (b) UV-Vis plot of degradation of MO under optimized reaction conditions (50 mL stock solution (10 mg/L), 2 mL H_2O_2, 20 mg catalyst, pH = 7, 60 min, r.t., λ_{max} = 465 nm).

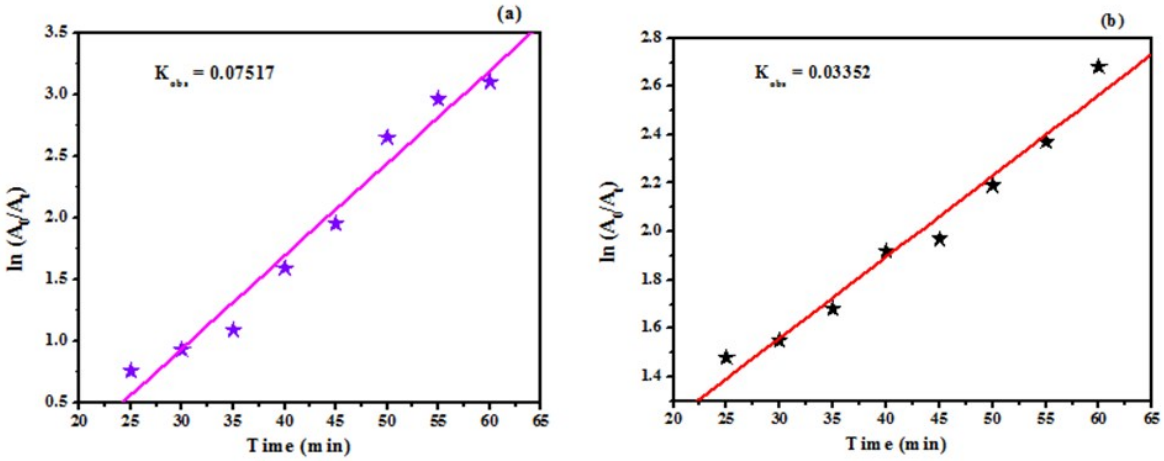

Fig. S7 Kinetics analysis of oxidative degradation of (a) 2,4-D and (b) MO.

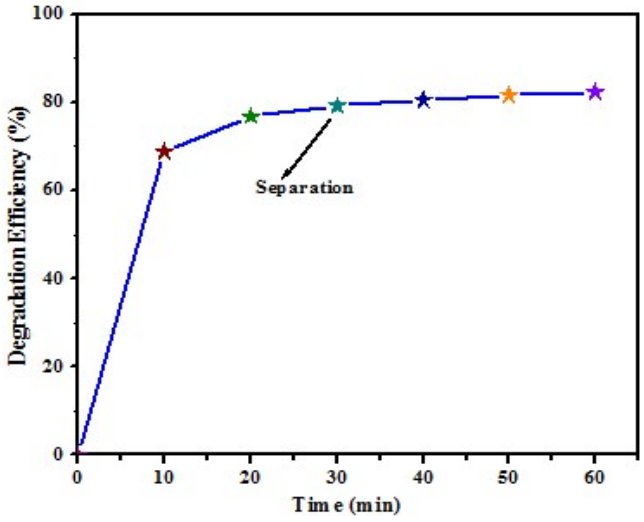

Fig. S8 Degradation efficiency versus reaction time in a leaching experiment.

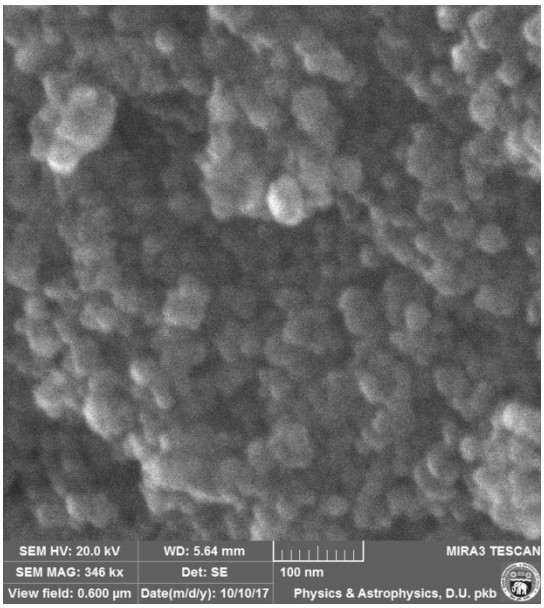

Fig. S9FE-SEM image of recovered catalyst Co-Ni@CS@Fe_3O_4.