

Supplementary Information

Table S1 XRF elemental analysis of CoRE_xFe_{2-x}O₄ (RE: Ce, La)

Ferrite	Co (wt%)		Ce; La (wt%)		Fe (wt%)		O (wt%)	
	Theo.	Obs.	Theo.	Obs.	Theo.	Obs.	Theo.	Obs.
CoFe₂O₄	25.12	25.02	--	--	47.60	47.65	27.28	27.33
CoCe_{0.1}Fe_{1.9}O₄	24.25	24.32	5.77	5.81	43.65	43.59	26.33	26.28
CoCe_{0.2}Fe_{1.8}O₄	23.44	23.48	11.14	11.17	39.97	39.95	25.45	25.40
CoCe_{0.3}Fe_{1.7}O₄	22.67	22.65	16.17	16.16	36.53	36.50	24.63	24.69
CoLa_{0.1}Fe_{1.9}O₄	24.26	24.29	5.72	5.70	43.67	43.62	26.35	26.39
CoLa_{0.2}Fe_{1.8}O₄	23.46	23.42	11.06	11.04	40.01	40.05	25.47	25.49
CoLa_{0.3}Fe_{1.7}O₄	22.71	22.75	16.05	16.01	36.58	36.55	24.66	24.69
CoLa_{0.4}Fe_{1.6}O₄	22.00	22.05	20.74	20.71	33.36	33.39	23.90	23.85
CoLa_{0.5}Fe_{1.5}O₄	21.34	21.37	25.15	25.18	30.33	30.30	23.18	23.15

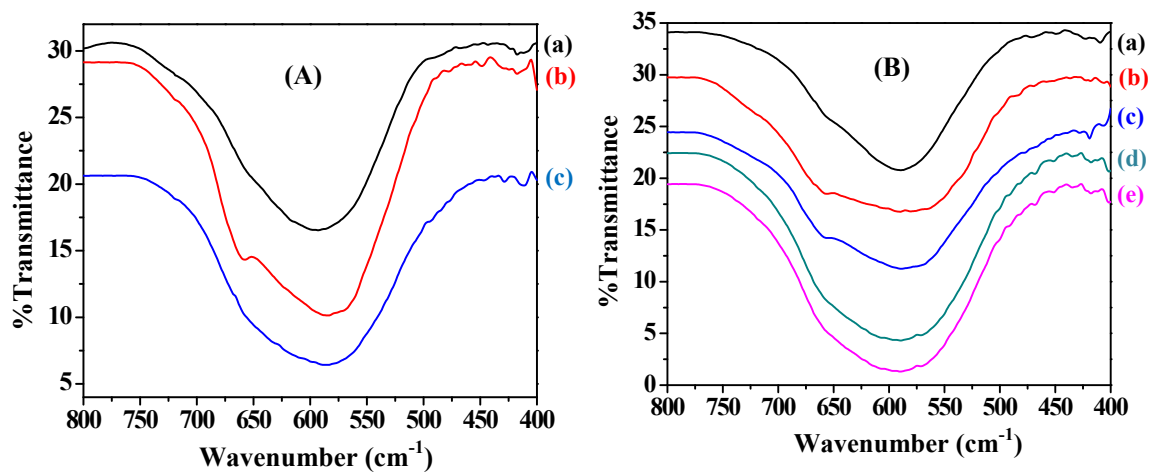


Fig. S1 FTIR Spectra of (A); (a) $\text{CoCe}_{0.1}\text{Fe}_{1.9}\text{O}_4$ (b) $\text{CoCe}_{0.2}\text{Fe}_{1.8}\text{O}_4$ (c) $\text{CoCe}_{0.3}\text{Fe}_{1.7}\text{O}_4$ and (B); (a) $\text{CoLa}_{0.1}\text{Fe}_{1.9}\text{O}_4$ (b) $\text{CoLa}_{0.2}\text{Fe}_{1.8}\text{O}_4$ (c) $\text{CoLa}_{0.3}\text{Fe}_{1.7}\text{O}_4$ (d) $\text{CoLa}_{0.4}\text{Fe}_{1.6}\text{O}_4$ and (e) $\text{CoLa}_{0.5}\text{Fe}_{1.5}\text{O}_4$

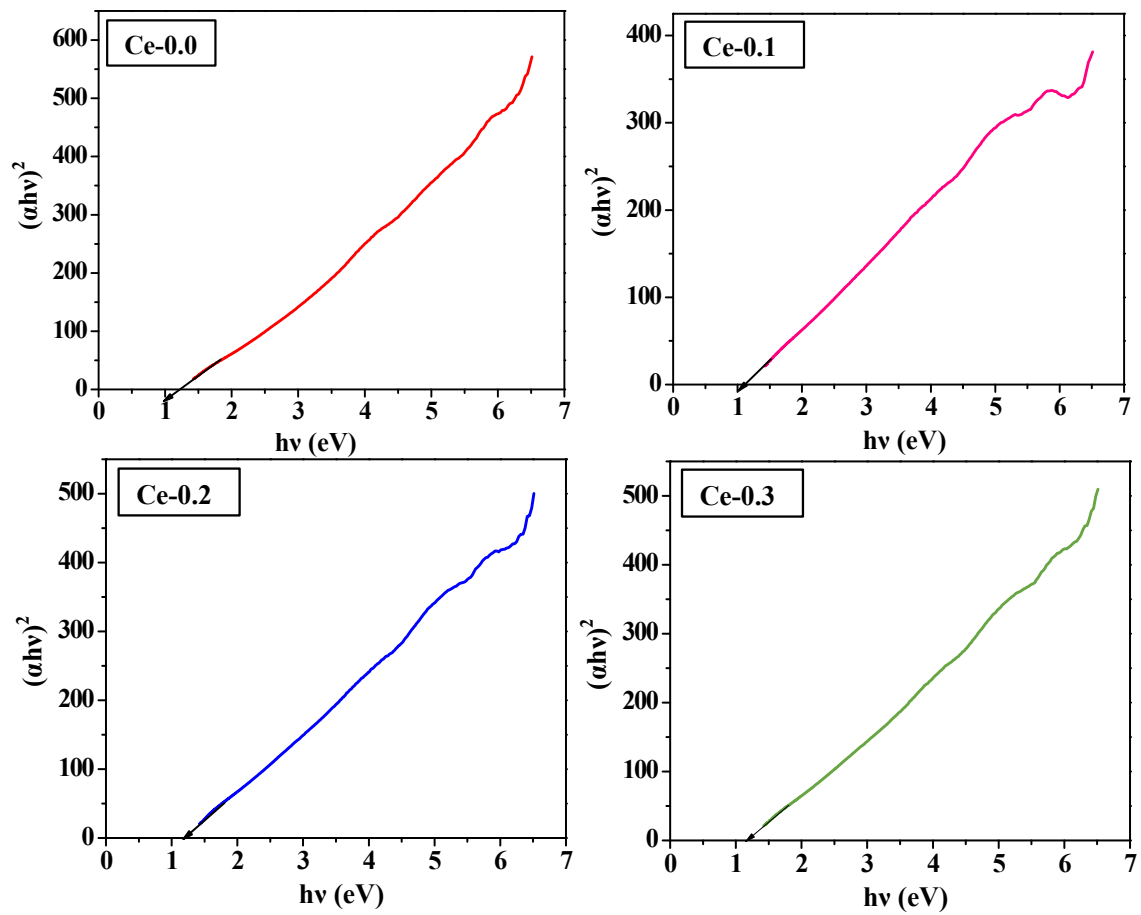


Fig. S2 Tauc plots of $\text{CoCe}_x\text{Fe}_{2-x}\text{O}_4$ ($x = 0.0, 0.1, 0.2, 0.3$)

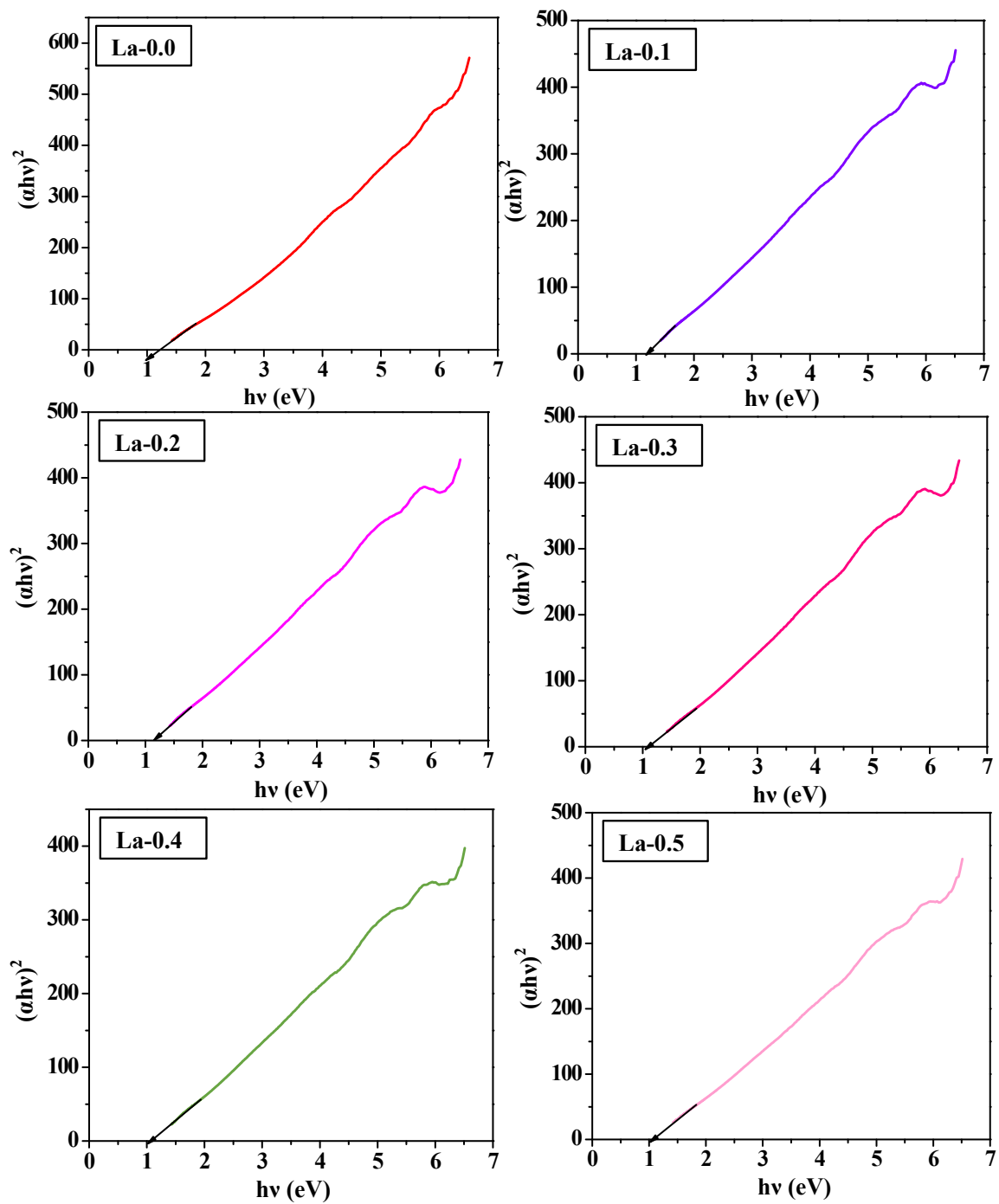


Fig. S3 Tauc plots of $\text{CoLa}_x\text{Fe}_{2-x}\text{O}_4$; $x = 0.0, 0.1, 0.2, 0.3, 0.4, 0.5$

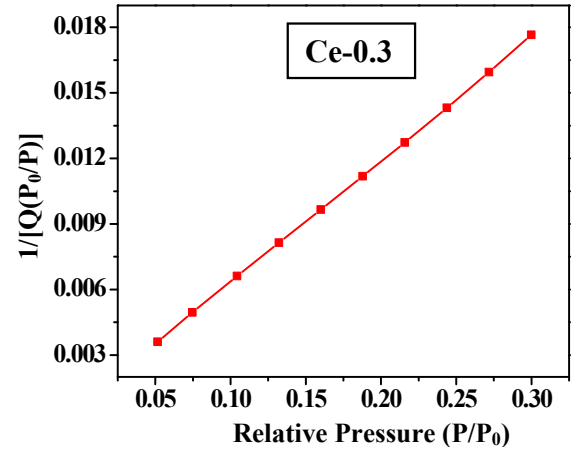
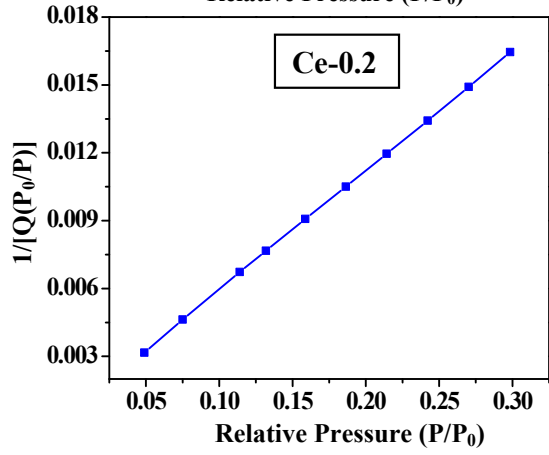
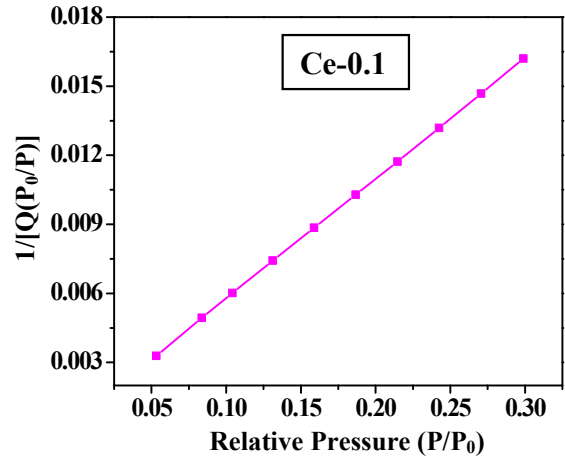
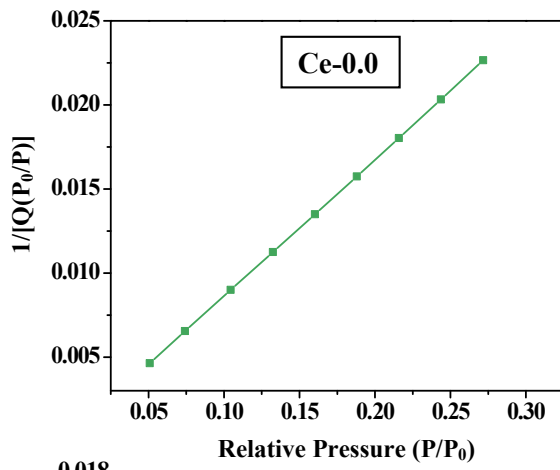


Fig. S4 BET plots of pure and Ce-doped CoFe_2O_4

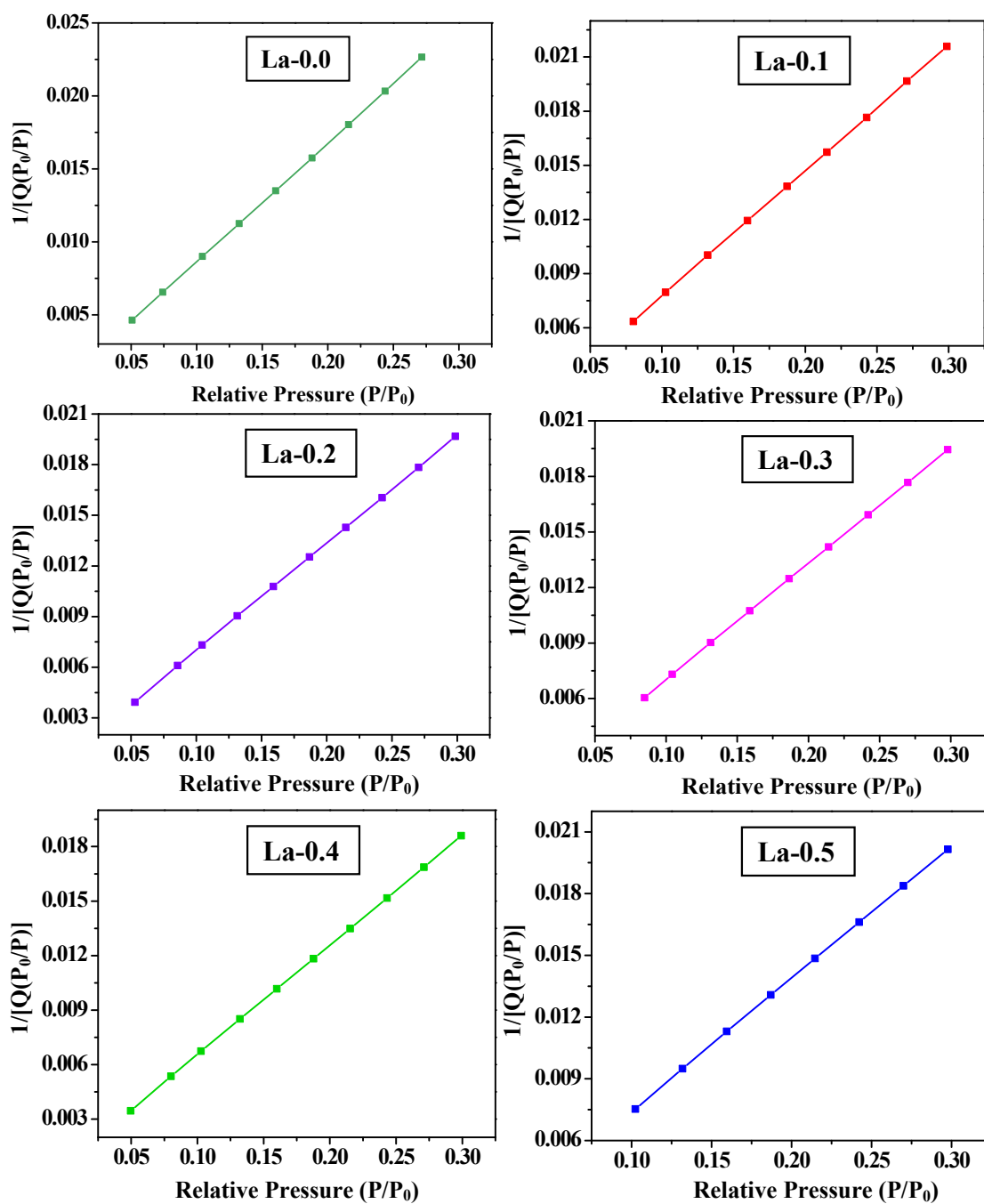


Fig. S5 BET plots of pure and La-doped CoFe_2O_4

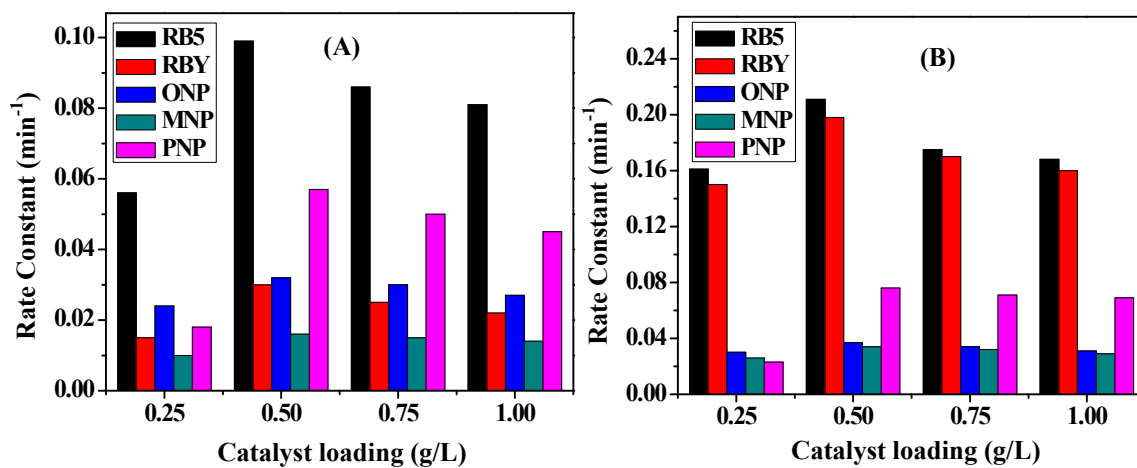


Fig. S6 Effect of catalyst loading on the photo-degradation of different organic pollutants using (A) HP and (B) PMS as oxidants in the presence of CoFe_2O_4

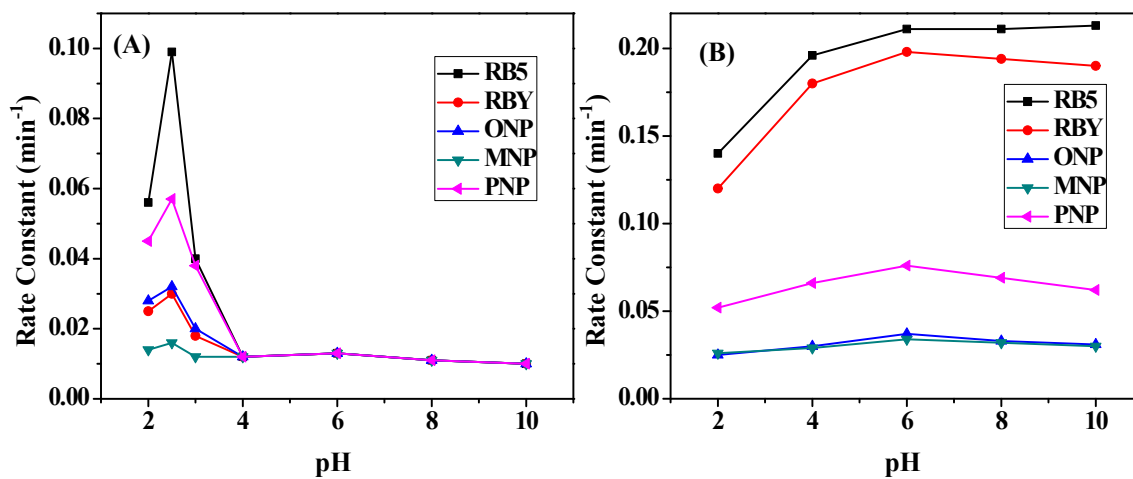


Fig. S7 Effect of pH on photo-degradation of different pollutants using (A) HP and (B) PMS as oxidants

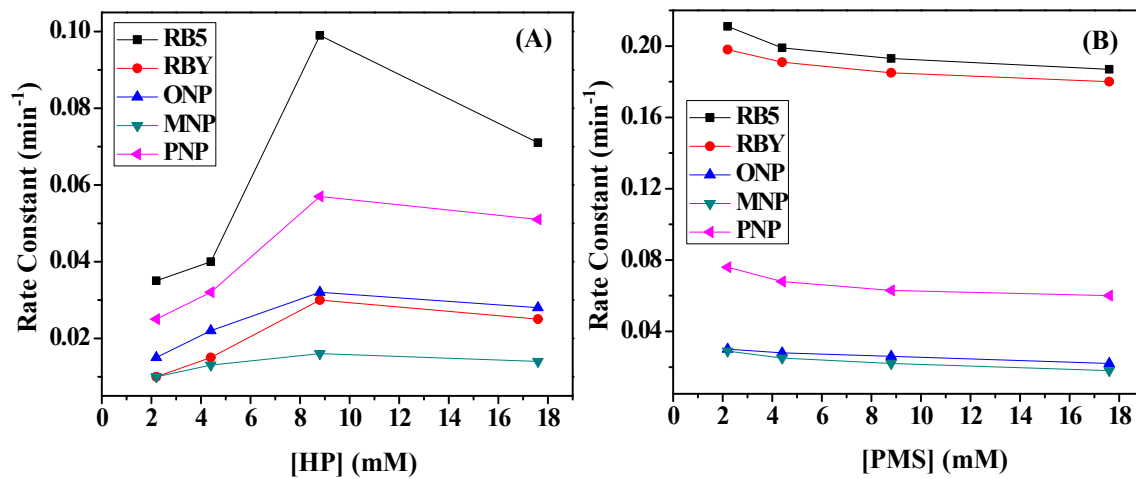


Fig.S8 Variation of rate constant with [oxidant] in the presence of (A) HP and (B) PMS while using all the probe molecules