Supporting Information Available for Degradation of Chlorophenols by Supported Co-Mg-Al Layered Double Hydrotalcite with Bicarbonate Activated Hydrogen Peroxide

Ali Jawad, Xiaoyan Lu, Zhuqi Chen, Guochuan Yin*

Key Laboratory for Large-Format Battery Materials and System, Ministry of Education, School of Chemistry and Chemical Engineering, Huazhong University of Science and Technology, Wuhan 430074, PR China

E-mail: gyin@hust.edu.cn

Contents:

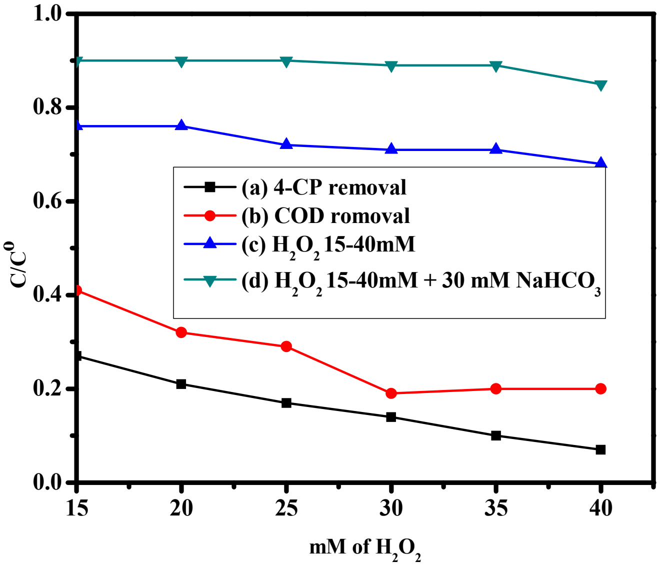

Figure S 1. Influence of H_2O_2 on the degradation of 4- Chlorophenol

Condition: (a) 4-CP solution 100 ppm, H_2O_2 15-40 mM, , $NaHCO_3$ 30mM, 0.03g Catalyst , reaction temperature 40 ^oC, reaction time 1h (b) removal of COD under condition 'a' (c) 4-CP solution 100 ppm, H_2O_2 15-40 mM, 0.03g Catalyst, no $NaHCO_3$ (d) 4-CP solution 100 ppm H_2O_2 15-40 mM, $NaHCO_3$ 30mM with no catalyst.

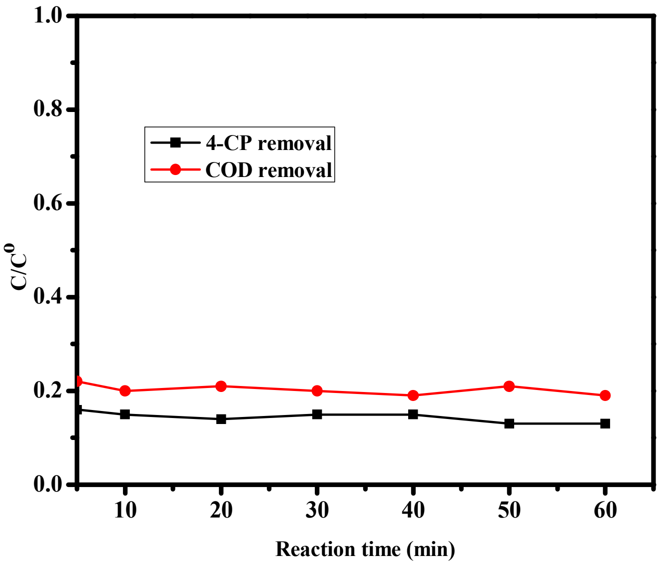

Figure S 2. Influence of Reaction time on the Degradation of 4-Chlorophenol

Conditions: 4-CP solution100 ppm, H_2O_2 and $NaHCO_3$ 30 mM, reaction temperature 40 ^{o}C,0.03g catalyst, reaction time 5-60 min.

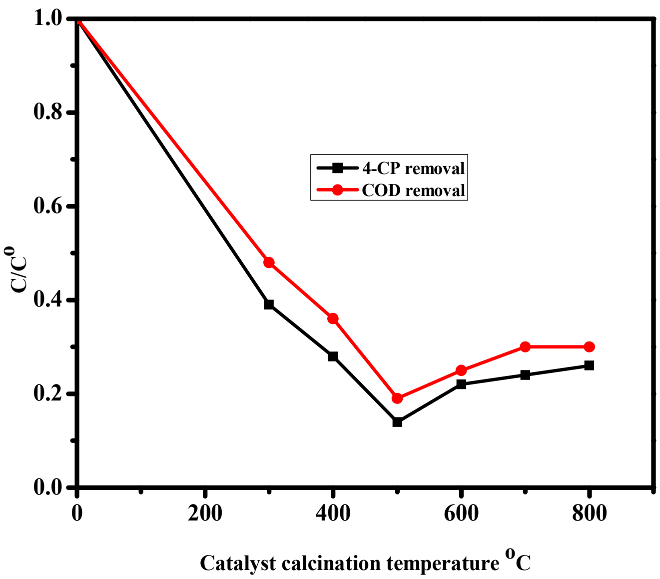

Figure S 3. Influence of catalyst calcination temperature on degradation of 4-CP

Condition: 4-CP solution 100 ppm, $NaHCO_3$ and H_2O_2 30 mM, 0.03g Catalyst, reaction time 1h, reaction temperature 40°C.

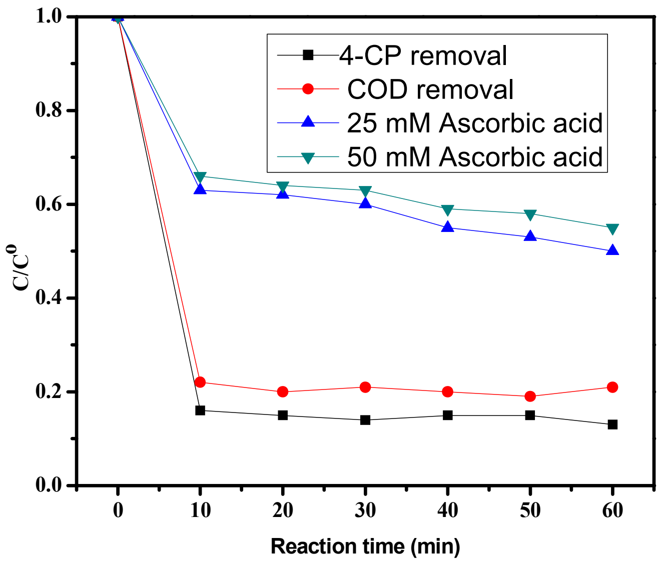

Figure S 4. Influence of ascorbic acid on the degradation of 4-chlorophenol

Conditions (a) 4-CP solution 100 ppm, H_2O_2 and $NaHCO_3$ 30 mM, reaction temperature 40 ^oC, 0.03g catalyst, reaction time 10-60 min (b) COD removal under condition 'a'(c) condition (a) + 25 mM ascorbic acid (d) condition (a) + 50 mM ascorbic acid.

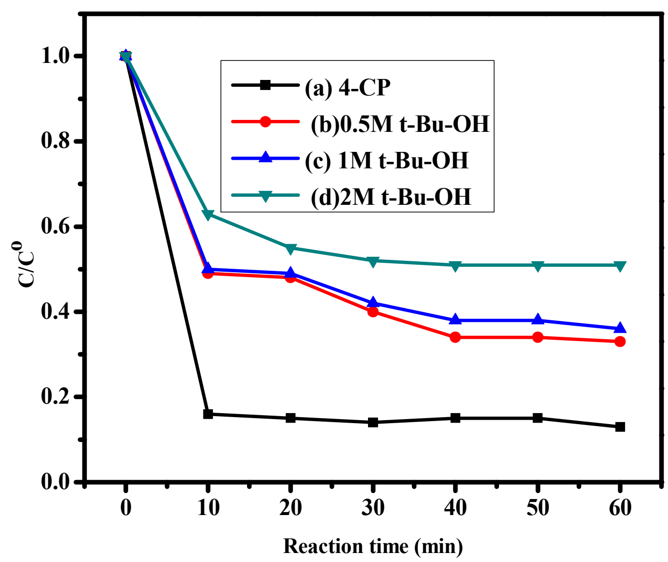

Figure S 5. Influence of t-butanol on the degradation of 4-CP

Conditions: (a)4-CP solution 100 ppm, H_2O_2 and $NaHCO_3$ 30 mM, reaction temperature 40 ^oC, 0.03g catalyst, reaction time 10-60 min (b) condition (a) + 0.5 M t-BuOH (c) condition (a) +1 M t-BuOH (d) condition (a) + 2 M t-BuOH.

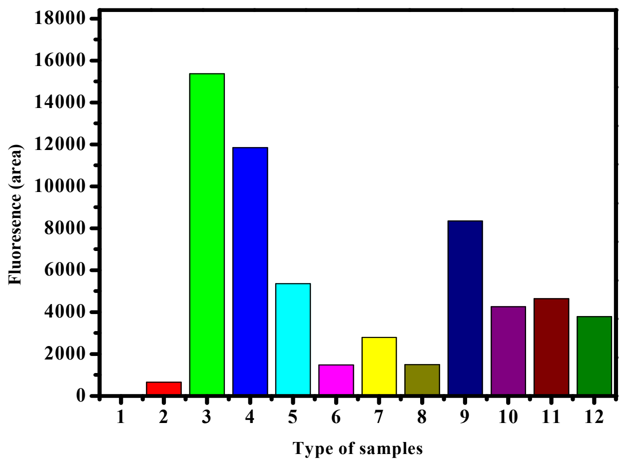

Figure S 6: Fluorescence study as indication of hydroxyl radical generation.

Conditions: Coumarin 3.5 mM, H_2O_2 30 mM, $NaHCO_3$ 30 mM, Catalyst 0.03g, t-butanol 0.5 M, NaN_3 5 mM, reaction time 20 min, reaction temperature 40 ^{0}C (1) Coumarin + H_2O_2 (2) coumarin + $NaHCO_3$ (3) Coumarin + H_2O_2 + $NaHCO_3$ (4)) Coumarin + H_2O_2 + $NaHCO_3$ + CP (5) Coumarin + H_2O_2 + $NaHCO_3$ + CP + Catalyst (6)) Coumarin + H_2O_2 + $NaHCO_3$ + CP + Catalyst + t-butanol (7) Coumarin + H_2O_2 + $NaHCO_3$ + CP + Catalyst + NaN_3 (8) Coumarin + H_2O_2 + $NaHCO_3$ + CP + Catalyst + t-butanol + NaN_3 (9) Coumarin + H_2O_2 + $NaHCO_3$ + Catalyst (10) Coumarin + H_2O_2 + $NaHCO_3$ + Catalyst + t-butanol (11) Coumarin + H_2O_2 + $NaHCO_3$ + Catalyst + NaN_3 (12) Coumarin + H_2O_2 + $NaHCO_3$ + Catalyst + t-butanol + NaN_3