Electronic Supplementary Material (ESI) for New Journal of Chemistry

Preparation of Cu-Cu_2O-CuO by solid combustion ignited by dielectric barrier discharge and its activity towards *p*-nitrophenol reduction

Wei Ding, Jiaying Yi, Xiang Wang, Lei Shi and Qi Sun

Faculty of Chemistry and Chemical Engineering, Liaoning Normal University, Dalian 116029, China. E-mail: sunqils@163.com; Fax: +86-0411-82156989; Tel: +86-0411-84258309

E-mail address: sunqils@163.com (Q. Sun)

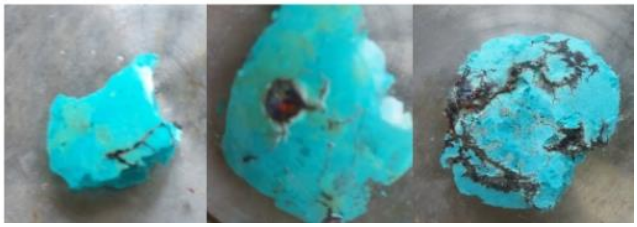


Figure S1 Non-ignited the precursor of φ = 1.5 with physically adsorbed water of 1.4%.

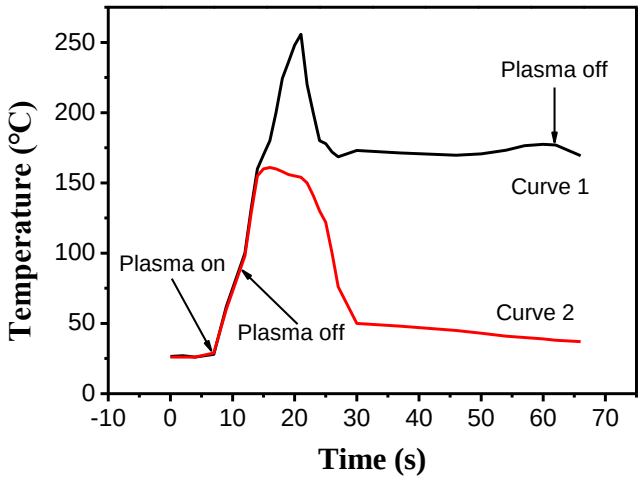
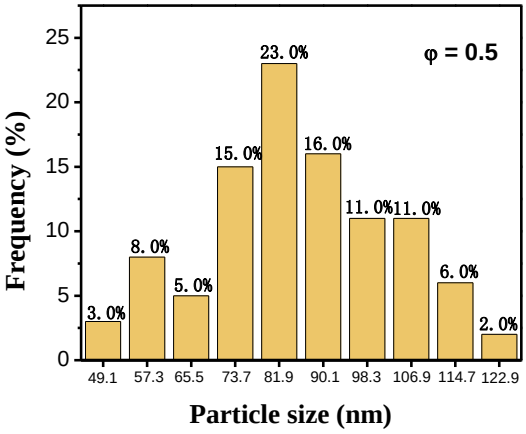
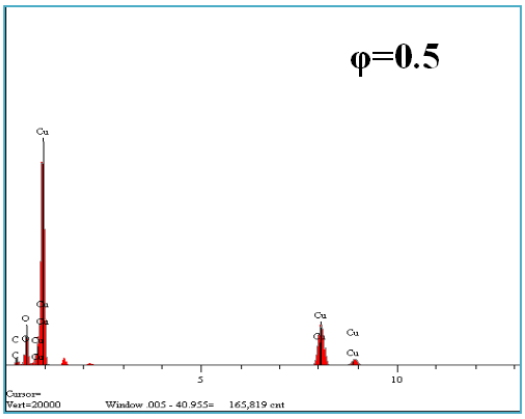
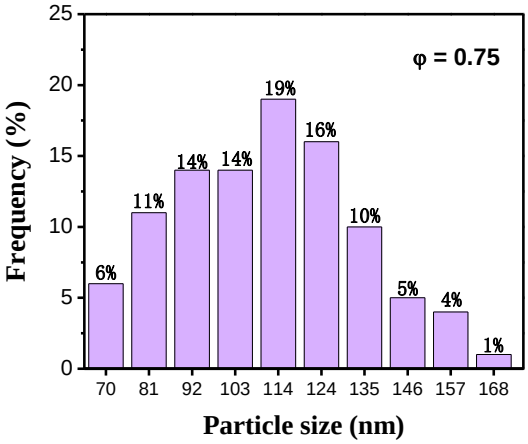
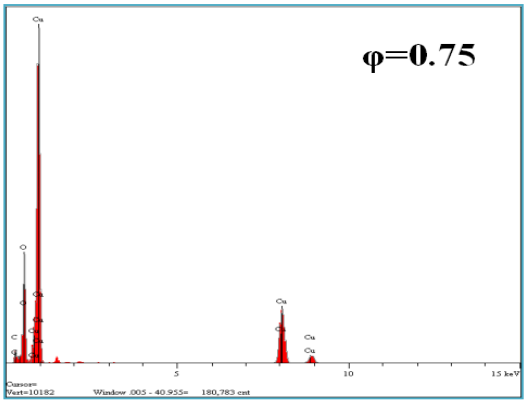


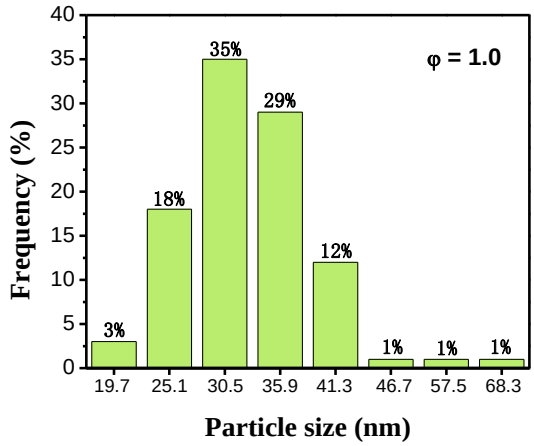
Figure S2 The change of bulk temperature with discharge time in the process of DBD plasma induced combustion.

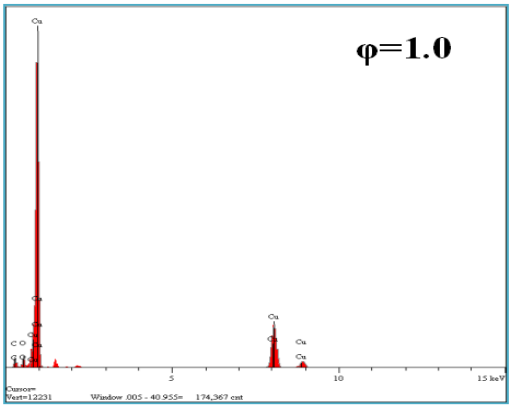

φ = 0.5
Frequency (%)
Particle size (nm)
3. 0%
8. 0%
5. 0%
15. 0%
23. 0%
16. 0%
11. 0%
11. 0%
6. 0%
2. 0%
49.1 57.3 65.5 73.7 81.9 90.1 98.3 106.9 114.7 122.9


φ=0.5


φ = 0.75
Frequency (%)
Particle size (nm)
6%
11%
14%
14%
19%
16%
10%
5%
4%
1%
70 81 92 103 114 124 135 146 157 168


φ=0.75


φ = 1.0
Frequency (%)
Particle size (nm)
3%
18%
35%
29%
12%
1%
1%
1%
19.7 25.1 30.5 35.9 41.3 46.7 57.5 68.3


φ=1.0

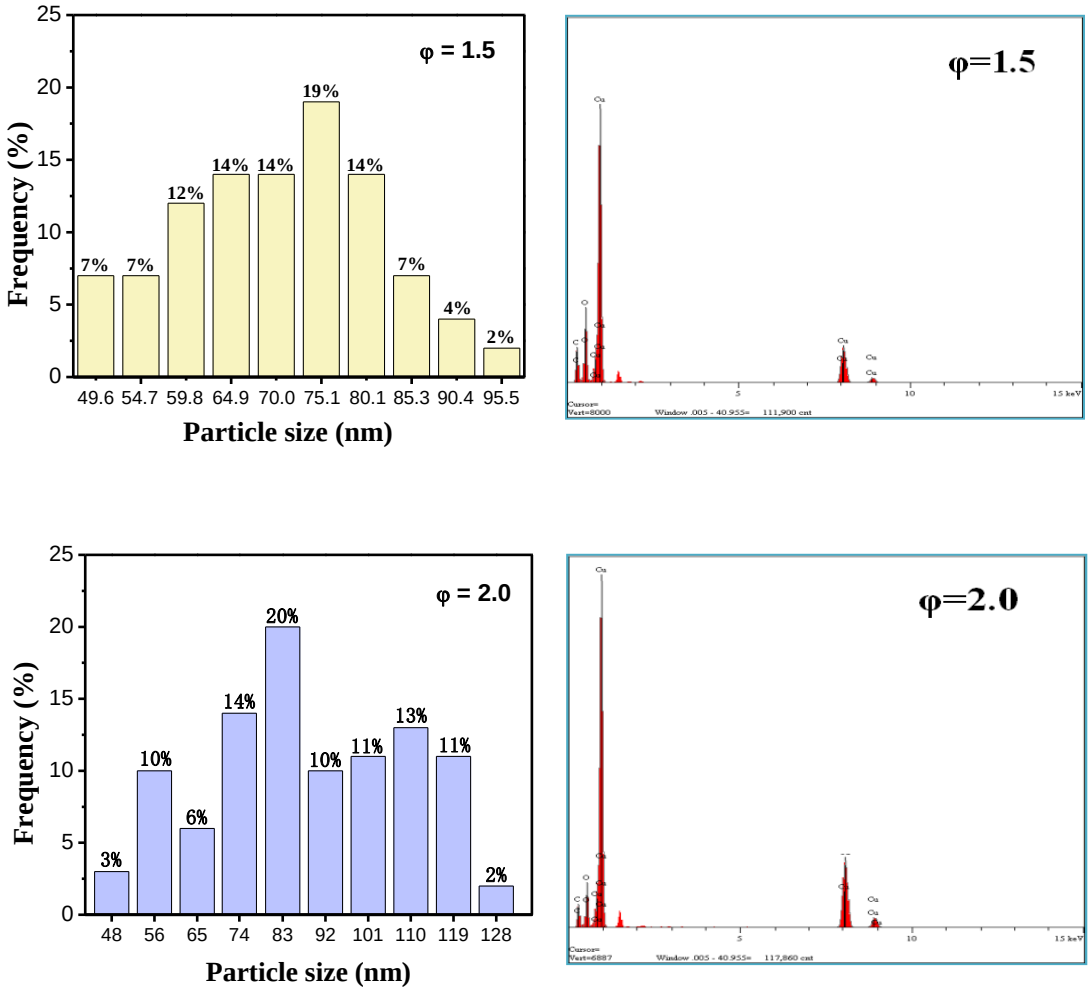


Figure S3 Size distribution histogram and EDX of φ = 0.5-2.0 samples and the changes of copper and oxygen surface concentration with φ.

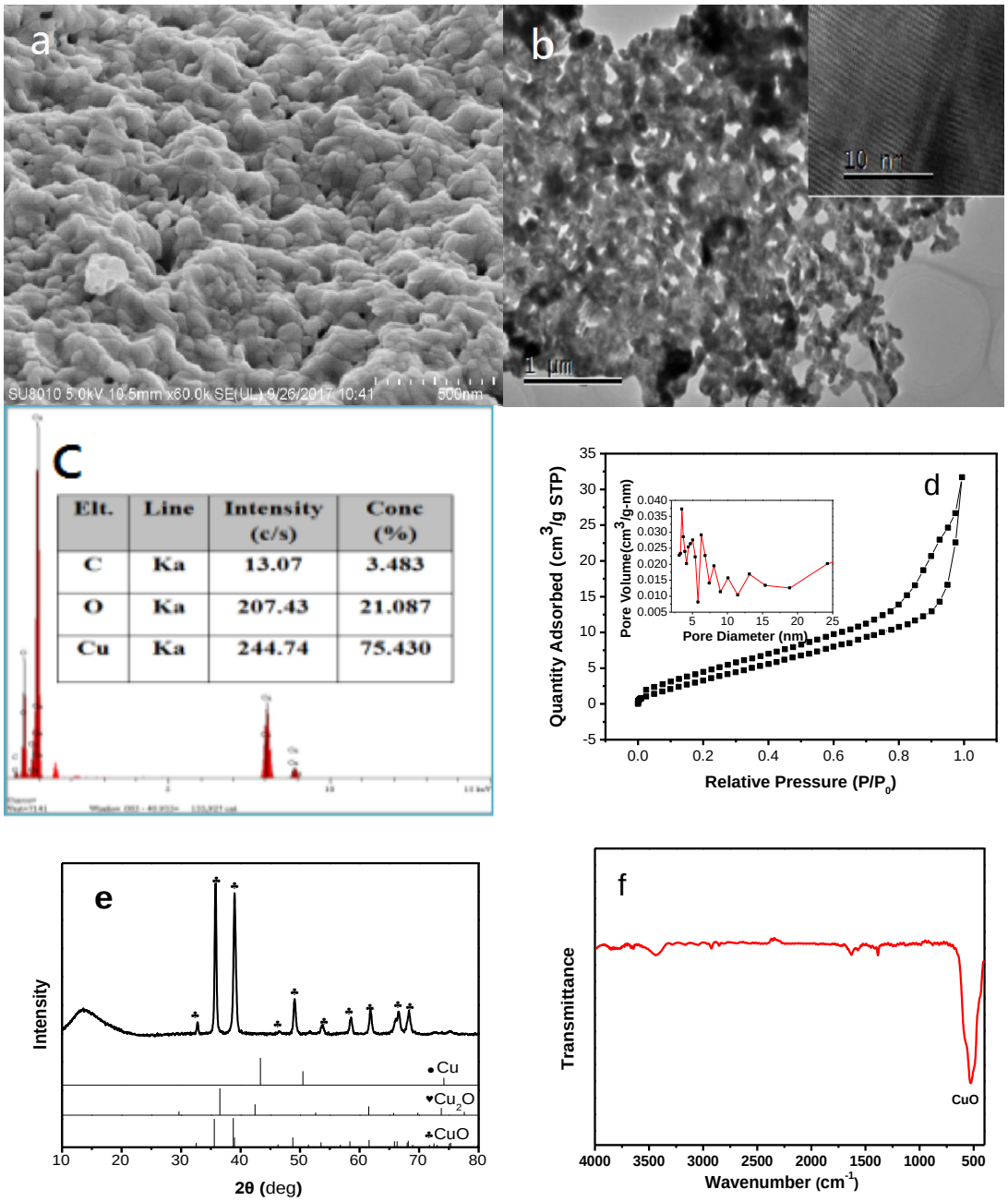


Figure S4 Characterization results of the sample prepared by chemical method (a) SEM (b) TEM (c) EDS (d) N_2 adsorption and desorption curves (e) XRD and (f) FTIR images of the chemical prepared sample.

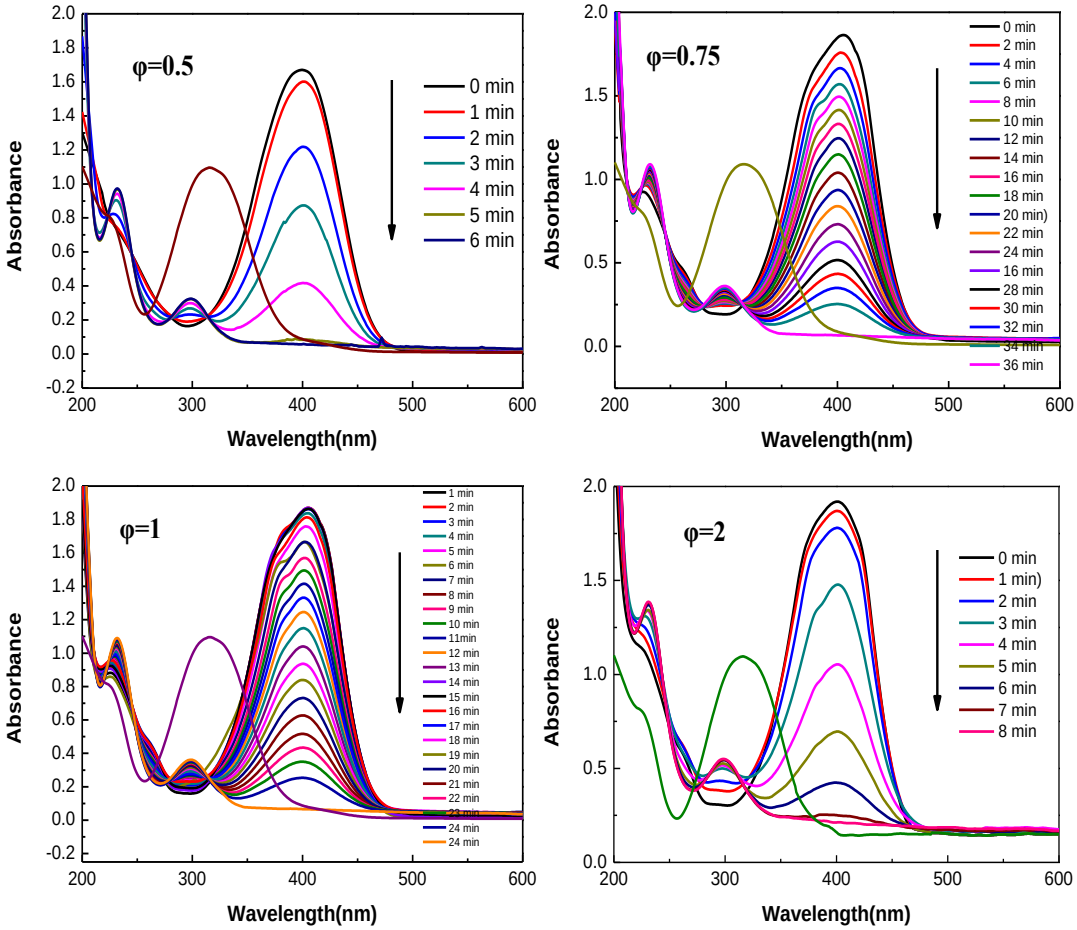


Figure S5 Comparison of the catalytic activities of the Cu-Cu_2O-CuO samples with different φ for the reduction of PNP by $NaBH_4$.

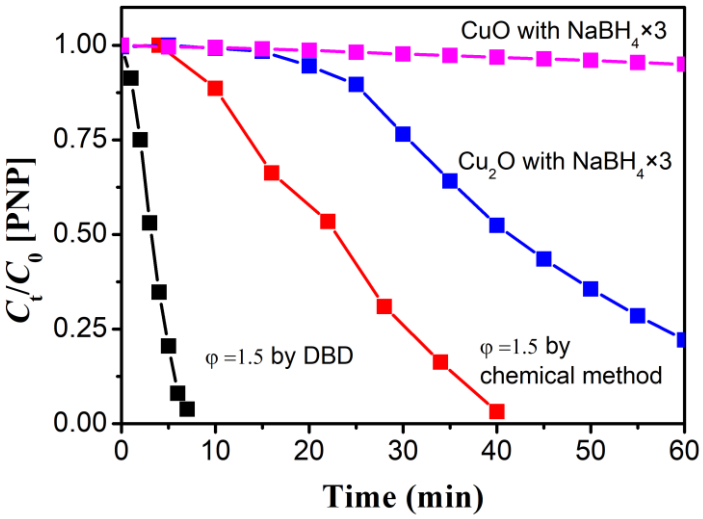


Figure S6 Comparison of the catalytic activities of the DBD and chemical method prepared samples of φ=1.5 and commercial CuO and Cu_2O for the reduction of PNP by $NaBH_4$.

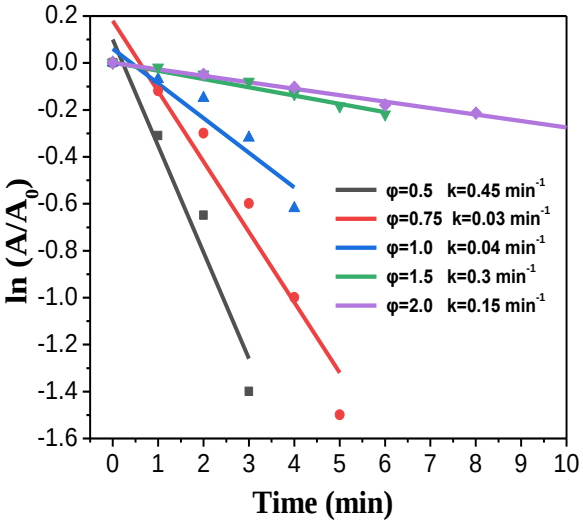


Figure S7 Apparent rate constants for the reduction of PNP by $NaBH_4$ using the Cu-Cu_2O-CuO with φ = 0.5, 0.75, 1 and 2.