Electronic Supplementary Material (ESI) for RSC Advances.

Supporting Information

Degradation of one-sided fully-chlorinated 1,2,3,4-tetrachloronapthalene over Fe-Al composite oxides and its hypothesized reaction mechanism

Yalu Liu,[ab] Huijie Lu,[abc] Wenxiao Pan,[ab] Qianqian Li,[ab] Guijin Su,[*ab] Minghui Zheng,[ab] Lirong Gao,[ab] Guorui Liu,[ab] and Wenbin Liu[ab]

[a]State Key Laboratory of Environmental Chemistry and Ecotoxicology, Research Center for Eco-Environmental Sciences, Chinese Academy of Sciences, P.O. Box 2871, Beijing 100085, China

[b]University of Chinese Academy of Sciences, Beijing 100049, China

[c]Beijing Environmental Sanitation Engneering Research Institute, Jia no. 48 Shangjialou, Chaoyang District, Beijing 100028, China.

*Corresponding author: Dr. Guijin Su; Tel: +86 10 62849356; Fax: + 86 10 62923563; E-mail address: gjsu@rcees.ac.cn (G. Su).

In addition, XPS characterization could be also used to confirm the composition of the elements and their valent state in the as-prepared Fe-Al-O nanoshpere. **Fig. S1(a)** shows that the binding energies of 711.0 eV and 724.5 eV respectively were assigned to Fe $2p_{1/2}$ and Fe $2p_{3/2}$. The binding energies of 74.35 eV observed in the Al 2p after peak separation as Al $2p_{1/2}$ and Al $2p_{3/2}$ located at 73.9 eV and 74.5 eV in **Fig. S1(b)** correspond well to characteristic Al^{3+} peak in Al_2O_3.[1,2] This analysis further confirmed the XRD results.

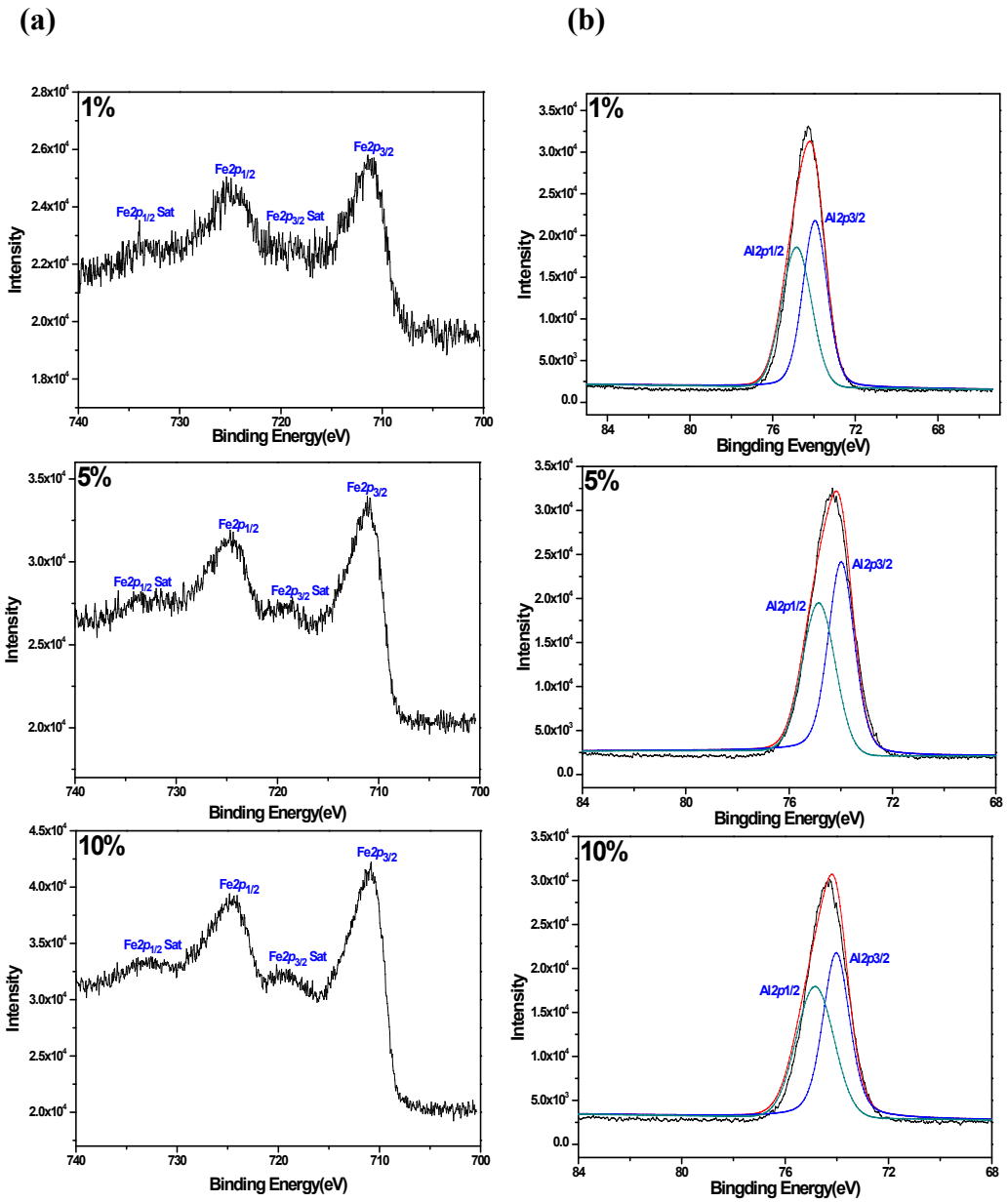

Fig. S1 (a) Fe 2p and (b) Al 2p XPS spectrum of series iron and aluminum composite oxides.

The formic acid and acetic acid were detected on the reaction and the ion chromatogram were shown below in **Fig. S2.** This indicates the occurrence of oxidation pathway involved with the formation of cracking products.

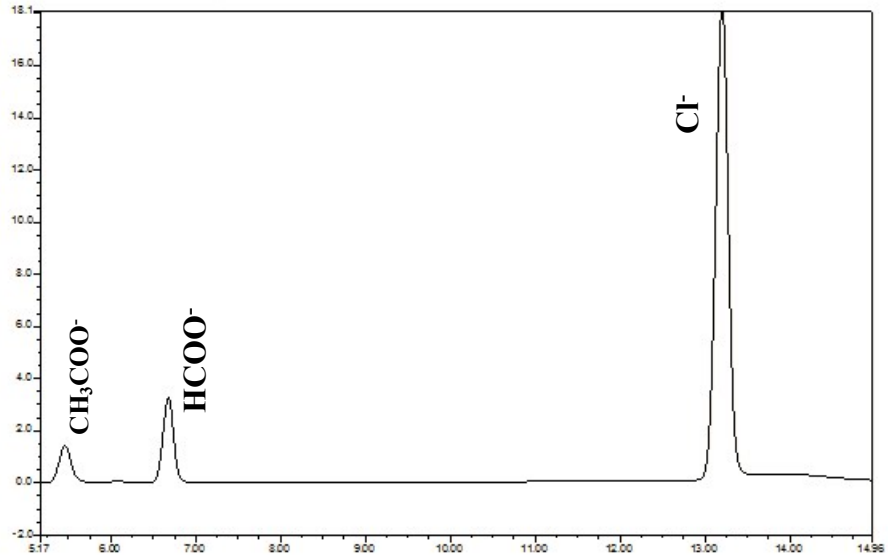

Fig.S2 IC of organic acids and chlorine ion generated following degradation of CN-27 over Fe-Al-5 composite oxides

Reference:

1. J. T. Kloprogge and B. J. Wood, Journal of Materials Science, 2016, 51, 5436-5444.
2. I. Iatsunskyi, M. Kempiński, M. Jancelewicz, K. Załęski, S. Jurga and V. Smyntyna, Vacuum, 2015, 113, 52-58.