# Supplementary Materials

## Comparative study of atenolol photodegradation by Fe(III)-complex activated peroxydisulfate/peroxymonosulfate systems

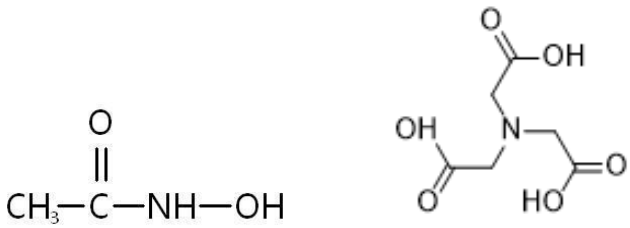
Yanlin Wu[1,4*], Lanhua Luo[1], Yuan Li[2], Shanghua Shi[2], Xiaoning Wang[3], Wenbo Dong[2], Gilles Mailhot[4*]

1. School of Resources and Environmental Engineering, Shanghai Polytechnic University, Shanghai 201209, China

2. Shanghai Key Laboratory of Atmospheric Particle Pollution and Prevention, Department of Environmental Science & Engineering, Fudan University, Shanghai 200433, China

3. Suzhou Key Laboratory of Green Chemical Engineering, School of Chemical and Environmental Engineering, College of Chemistry, Chemical Engineering and Materials Science, Soochow University, Suzhou, Jiangsu 215123, China

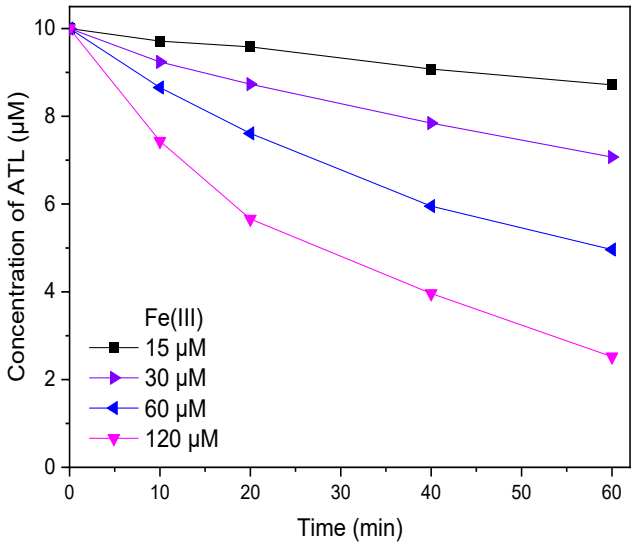
4. Institut de Chimie de Clermont-Ferrand, UMR 6296 CNRS - Université Clermont Auvergne, F-63000 Clermont-Ferrand, France



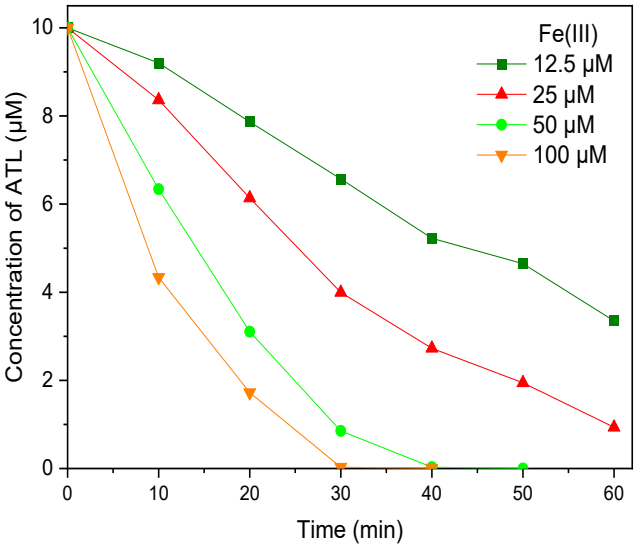

(a) (b)

**Figure S1** The chemical structures of AHA (a) and NTA (b).

*Corresponding author.
E-mail: wuyanlin@fudan.edu.cn (Y. Wu), gilles.mailhot@uca.fr (G. Mailhot).




(a)




(b)

**Figure S2** Effect of different Fe(III) concertation on the degradation of ATL in (a) Fe(III)-AHA/PDS system ([PDS] = 100 μM, [AHA] = 30 μM, pH = 6.5) and (b) Fe(III)-NTA/PMS system ([PMS] = 100 μM, [NTA] = 25 μM, pH = 6.5)

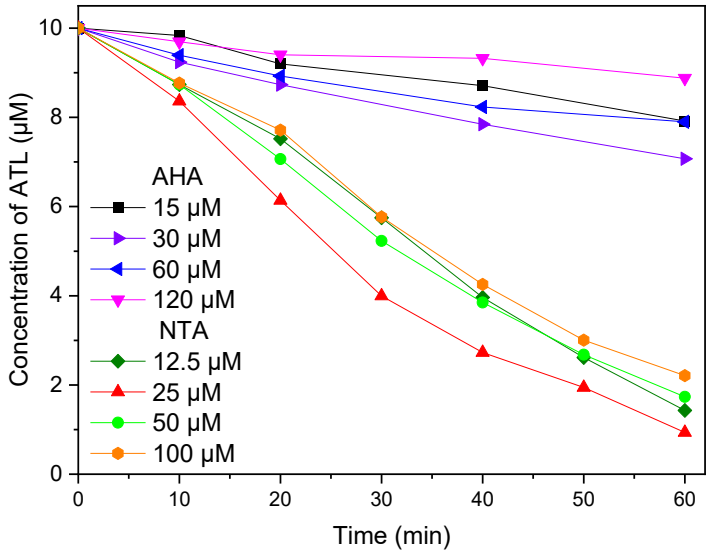
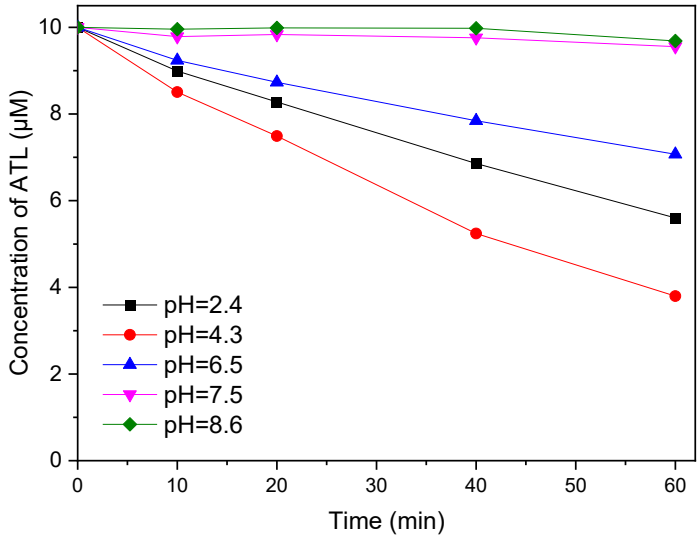
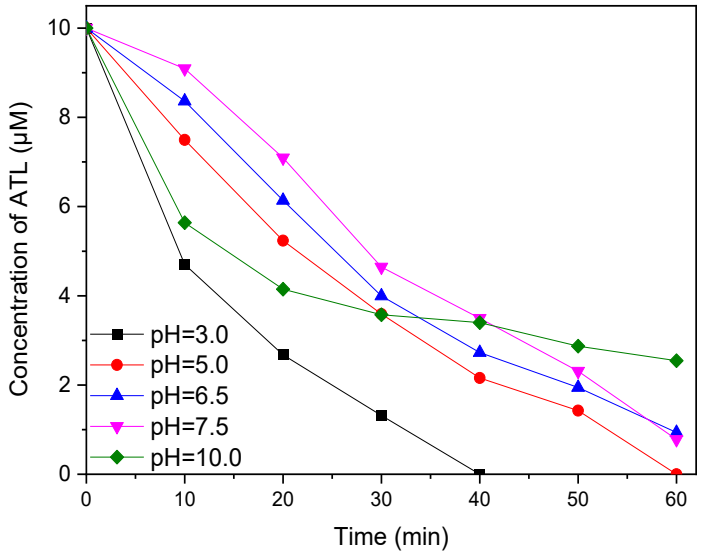



**Figure S3** Effect of different ligand (AHA/NTA) concertation on the degradation of ATL ([PDS] = [PMS] = 100 μM, Fe(III) = 30 μM in AHA system, Fe(III) = 25 μM in NTA system, pH=6.5)




(a)




(b)

**Figure S4** Effect of different pH on the degradation of ATL in (a) Fe(III)-AHA/PDS system ([PDS] = 100 μM, Fe(III)-AHA = 30 μM-30 μM) and (b) Fe(III)-NTA/PMS system ([PMS] = 100 μM, Fe(III)-NTA = 25 μM-25 μM)

**Table S1.** The TOC in NTA system

| Reaction time (h) | TOC (mg/L) | Degradation rate |
|---|---|---|
| 0 | 3.512 | / |
| 1 | 3.506 | 0.17% |
| 12 | 2.687 | 23.5% |

**Table S2.** The $k_{obs}$ and $R^2$ in different reaction conditions and systems

| System | Reaction condition | $k_{obs}$ ($s^{-1}$) | $R^2$ |
|---|---|---|---|
| light/Fe(III)-AHA/PDS [ATL]=10 μM, [PDS]=100 μM, [AHA]=30 μM, pH=6.5 This work | [Fe(III)] =15 μM | $(3.88\pm0.21)\times10^{-5}$ | 0.983 |
| | [Fe(III)] =30 μM | $(9.54\pm0.45)\times10^{-5}$ | 0.985 |
| | [Fe(III)] =60 μM | $(2.04\pm0.16)\times10^{-4}$ | 0.976 |
| | [Fe(III)] =120 μM | $(3.92\pm0.13)\times10^{-4}$ | 0.981 |
| light/Fe(III)-NTA/PDS [ATL]=10 μM, [PMS]=100 μM, [NTA]=25 μM, pH=6.5 This work | [Fe(III)] = 12.5 μM | $(2.71\pm0.29)\times10^{-4}$ | 0.967 |
| | [Fe(III)] = 25 μM | $(5.77\pm0.42)\times10^{-4}$ | 0.963 |
| | [Fe(III)] = 50 μM | $(1.86\pm0.28)\times10^{-3}$ | 0.918 |
| | [Fe(III)] = 100 μM | $(2.59\pm0.31)\times10^{-3}$ | 0.903 |
| light/Fe(III)-DFOB/PDS [28] ([ATL] = 2.5 mg/L= 9.4 μM, [PDS] = 500 μM, pH = 6.5 | [Fe(III)-DFOB] = 15 μM, | $1.317\times10^{-4}$ | / |
| light/Fe(III)-CAT/PDS [46] [ATL]=10 μM, [PDS]=100 μM, pH=3.3 | [Fe(III)] = 50 μM [CAT]=5 μM | $(4.29\pm0.53)\times10^{-4}$ | 0.961 |

## References


28. Wu, Y.; Qiu, T.; Wang, Y.; Liu, H.; Sun, W.; Dong, W.; Mailhot, G. Application of a Microbial Siderophore Desferrioxamine B in Sunlight/$Fe^{3+}$/Persulfate System: From the Radical Formation to the Degradation of Atenolol at Neutral pH. *Environ. Sci. Pollut. Res.* **2020**, *27*, 36782–36788. https://doi.org/10.1007/s11356-020-09692-2.
46. Yanlin Wu, Olivier Monfort, Wenbo Dong, Marcello Brigante, Gilles Mailhot. Enhancement of iron-mediated activation of persulfate using catechin: From generation of reactive species to atenolol degradation in water. Science of the Total Environment, 2019, 697, 134188. DOI：10.1016/j.scitotenv.2019.134188