Supplemental File for

**The enhanced effect of oxalic acid on the electroreduction of Cr(VI) via formation of intermediate Cr(VI)-oxalate complex**

Yijie Liu1,2, Shuaishuai Xin2, Bo Jiang1,2,\*

*1 State Key Laboratory of Petroleum Pollution Control, CNPC Research Institute of Safety and*

*Environmental Technology, Beijing, 102206, China*

*2 School of Environmental and Municipal Engineering, Qingdao University of Technology, Qingdao 266033, PR China;*

\*Corresponding author: [bjiang86upc@163.com](mailto:bjiang86upc@163.com) (B. Jiang)

Number of pages (including this page):7

Number of figures:4

Number of Table: 1

**Fig. S1.**The speciation distribution of Cr(VI) species at pH 0~12.

**Fig. S2.** Variation of Cr(VI) and H2O2 concentrations during the direct reduction. ([Cr(VI)]0 = 1.0 mM, [H2O2] = 16.2 mg L-1, pH= 3.0, [Ox]0 = 5.0 mM).

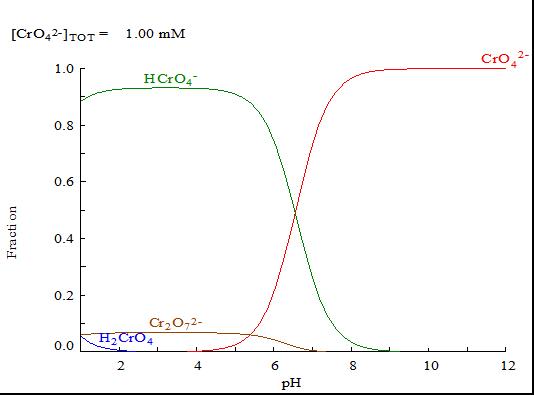
**Fig. S3.** Effect of EtOH and Ox on Cr(VI) reduction in electrolysis system. ([Cr(VI)]0 = 1.0 mM, [EtOH]0 = 50 mM, [Ox]0 = 5.0 mM, pH=3.0, I = 20 mA).

**Fig. S4.** Effect of Ox concentration on the current efficiency of Cr(VI) reduction.

([Cr(VI)]0 = 1.0 mM, I = 20 mA, pH= 3.0).

**Table. S1.** Results summarized for Cr(VI) reduction in electrolysis system. (Unless otherwise specified, [Cr(VI)]0 = 1.0 mM, pH= 3.0, I = 20 mA, [Ox]0 = 5.0 mM).

**Fig. S1**



**Fig. S2**

F:\学术\论文稿\The enhanced effect of oxalic acid on the electroreduction of Cr(VI) via formation of intermediate Cr(VI)-oxalate complex\第一篇\FS2.tif

**Fig. S3**

F:\学术\论文稿\The enhanced effect of oxalic acid on the electroreduction of Cr(VI) via formation of intermediate Cr(VI)-oxalate complex\第一篇\FS3.tif

**Fig. S4**

F:\学术\论文稿\The enhanced effect of oxalic acid on the electroreduction of Cr(VI) via formation of intermediate Cr(VI)-oxalate complex\第一篇\FS4.tif

Table S1.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| NO. | Variation parameters | Reduction  time (h) | Average  reduction rate(mM h-1) | Reduction efficiency | Current efficiency |
| 1. | 0.1 mM Cr(VI) | 0.5 | 0.2 | 99% | 16% |
| 2. | 0.2 mM Cr(VI) | 0.67 | 0.3 | 100% | 24% |
| 3. | 0.5 mM Cr(VI) | 1 | 0.48 | 97% | 39% |
| 4. | 1.0mM Cr(VI) | 1.5 | 0.66 | 99% | 53% |
| 5. | 2.0 mM Cr(VI) | 1.5 | 0.64 | 48% | 51% |
| 6. | 0 mM Ox | 1.5 | 0.23 | 36% | 19% |
| 7. | 2.0 mM Ox | 1.5 | 0.38 | 58% | 31% |
| 8. | 4.0 mM Ox | 1.5 | 0.55 | 83% | 44% |
| 9. | 5.0 mM Ox | 1.5 | 0.66 | 99% | 53% |
| 10. | 10 mM Ox | 1.3 | 0.74 | 99% | 61% |
| 11. | pH 2.0 | 1 | 0.96 | 97% | 78% |
| 12. | pH 2.5 | 1.3 | 0.72 | 97% | 60% |
| 13. | pH 3.0 | 1.5 | 0.66 | 99% | 53% |
| 14. | pH 3.5 | 1.5 | 0.28 | 43% | 23% |
| 15. | 10 mA | 1.5 | 0.38 | 58% | 62% |
| 16. | 20 mA | 1.5 | 0.66 | 99% | 53% |
| 17. | 30 mA | 1.17 | 0.84 | 97% | 44% |
| 18. | 40 mA | 1 | 0.96 | 97% | 39% |