

## **Electronic supplementary information (ESI)**

### **Solvometallurgical process for extraction of copper from chalcopyrite and other sulfidic ore minerals**

Xiaohua Li,<sup>\*a</sup> Wouter Monnens,<sup>b</sup> Zheng Li,<sup>a</sup> Jan Fransaer<sup>b</sup> and Koen Binnemans<sup>a</sup>

<sup>a</sup> KU Leuven, Department of Chemistry, Celestijnenlaan 200F, P.O. box 2404, B-3001 Leuven, Belgium.

<sup>b</sup> KU Leuven, Department of Materials Engineering, Kasteelpark Arenberg 44, bus 2450, B-3001 Heverlee, Belgium.

\* corresponding author: [xiaohua.li@kuleuven.be](mailto:xiaohua.li@kuleuven.be)

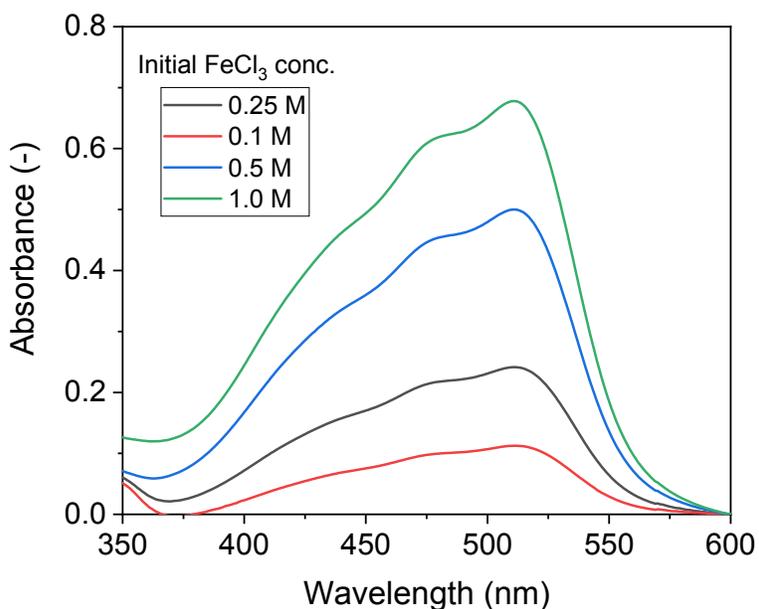


Figure S1. UV-Vis absorption spectra of the iron(II) 1,10-phenanthroline complex formed in the four leachates obtained from leaching of chalcopyrite with different initial FeCl<sub>3</sub> concentration (0.25-1.0 mol L<sup>-1</sup>) in the leaching agent. The UV samples were obtained by 5000 times dilution of the leachates.

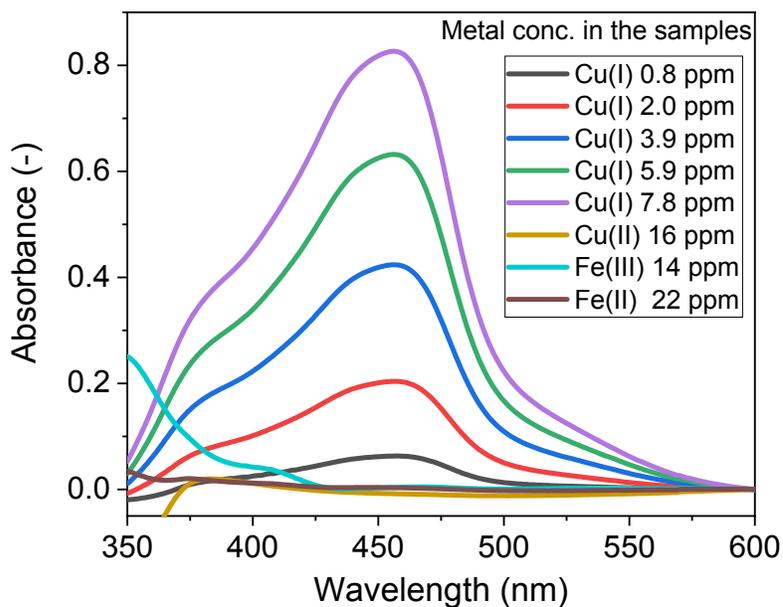


Figure S2. UV-Vis absorption spectra of the standard solutions of Cu(I) and other metals in the presence of neocuproine.

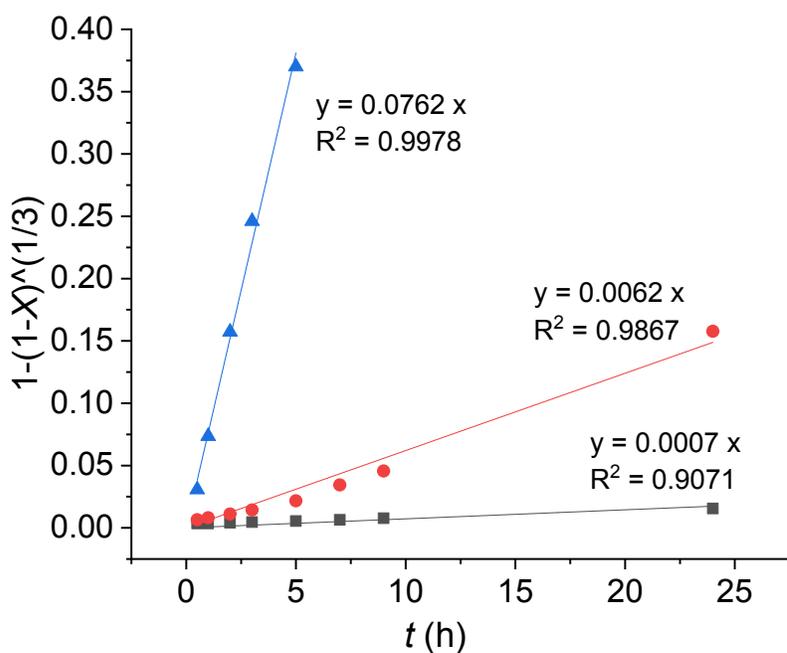


Figure S3. Fitted apparent rate constant  $k_c$  (the slope of the linear curve of  $1-(1-X)^{1/3}$  versus time  $t$ ) by using the chemical-reaction-control model: 22 °C (black), 60 °C (red), 90 °C (blue).

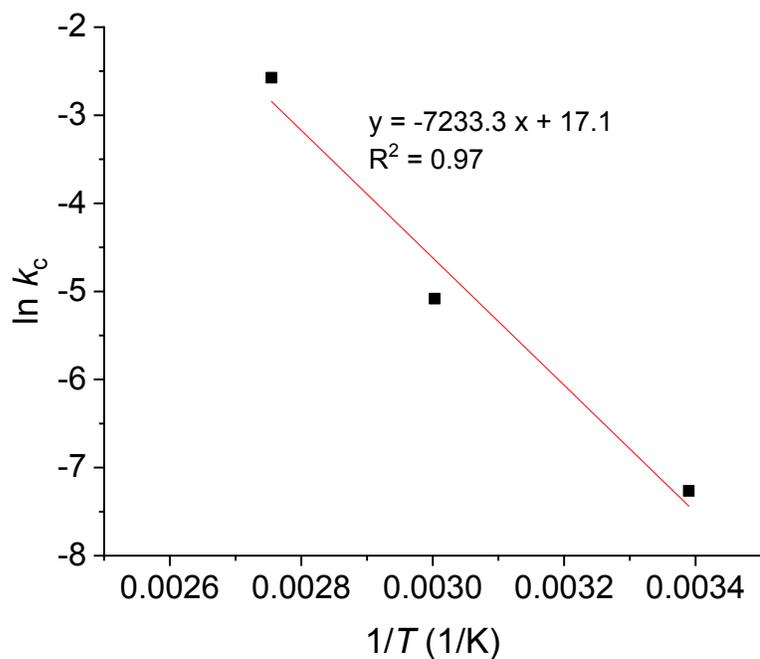


Figure S4. Arrhenius plot for chalcopyrite dissolution using data of the experimental kinetic equation for a chemical-reaction-control model.



Figure S5: Picture of the copper deposit, obtained by applying  $-0.30\text{ V vs. Ag/AgCl}$  for 2 hours.

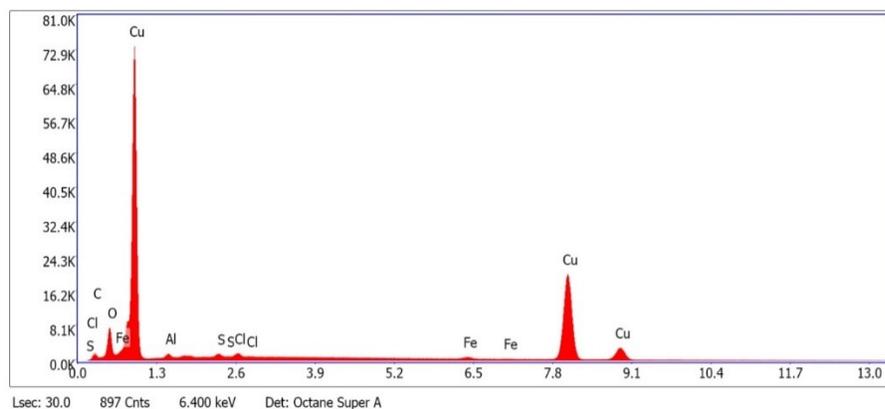


Figure S6: EDS spectrum of copper deposits at  $-0.30\text{ V vs. Ag/AgCl}$  was applied for 2 hours at room temperature. The applied accelerating voltage equaled 20 kV.

Table S1. Parameters for the microwave digestion program with DAP 40 vessels

	Temperature (°C)	Pressure (bar)	Ramp (min)	Hold (min)	Magnetron Power (%)
1	145	30	10	10	60
2	170	30	5	10	70
3	200	30	5	10	80
4	50	20	5	20	0
5	50	15	0	0	0