

1 **Appendix: Supporting Information**

2 **Efficient Removal of Sulfur Dioxide from Flue Gas**
3 **through Liquid Catalytic Oxidation Using Copper**
4 **Tailing as the *in situ* Iron Ion Donator**

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15 **Figure S1.** A copper pyrometallurgical process from Cu-Fe-S ores.

16 **Figure S2.** FT-IR spectra of raw and spent copper tailings.

17 **Figure S3.** SEM/EDS images of raw and spent copper tailing.
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1 Copper pyrometallurgical process

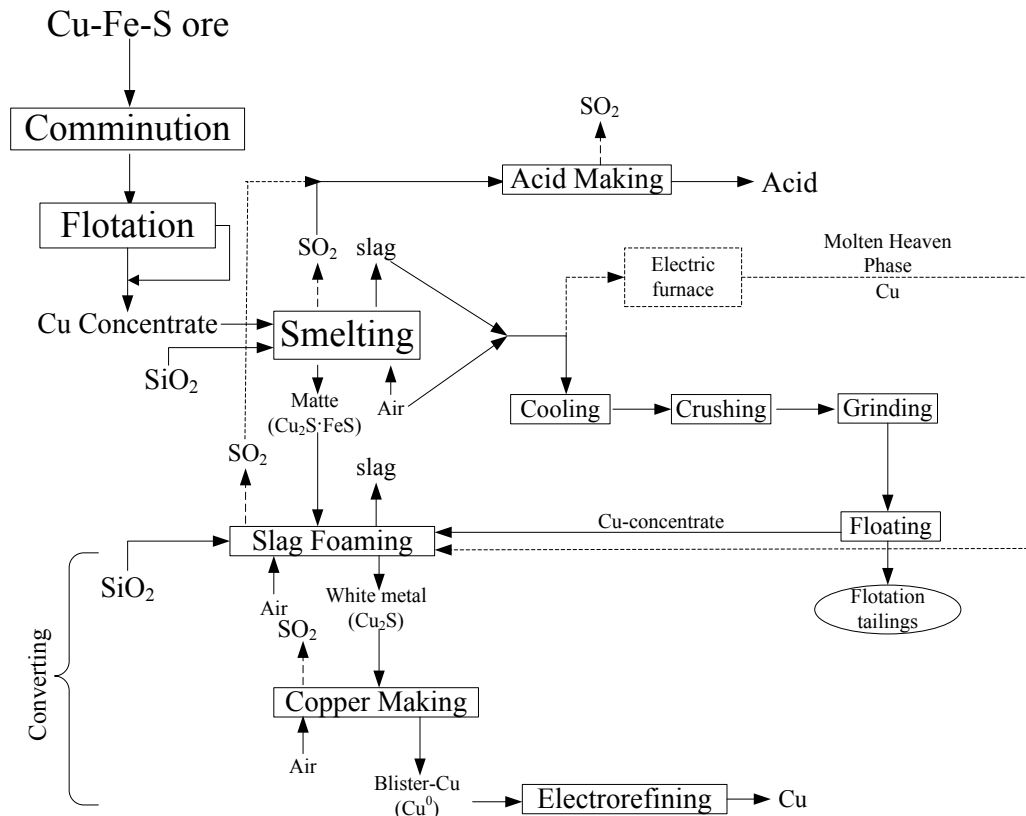


Fig. S1. A copper pyrometallurgical process from Cu-Fe-S ores [1].

Reference

[1] F. Carranza, N. Iglesias, A. Mazuelos, R. Romero, O. Forcat, Ferric leaching of copper slag flotation tailings, Minerals Engineering, 22(2009) 107-110.

FT-IR spectroscopy

The functional groups of the samples were identified using Fourier-transform infrared spectrometer (FTIR, Bruker Vertex 70). The FT-IR patterns of the copper tailing and the spent copper tailing are shown in Figure S1. As shown in Figure S1, the absorption peaks at around 1640 cm^{-1} are ascribed to O-H bending vibration, the absorption peaks at around 1097 cm^{-1} are ascribed to the symmetrical stretching vibration of Si-O-Si, and the FT-IR bands at about 798 and 467 cm^{-1} are ascribed to the symmetrical stretching vibration of Si-O bonds^{11,22}. Combined with the raw and spent copper tailing, the intensity of Si-O stretching vibration weakened slightly, other main absorption peaks remained almost identical, confirming that the dissolution of Fe_2SiO_4 and the main structure of copper tailing was stable during the flue gas desulfurization process.

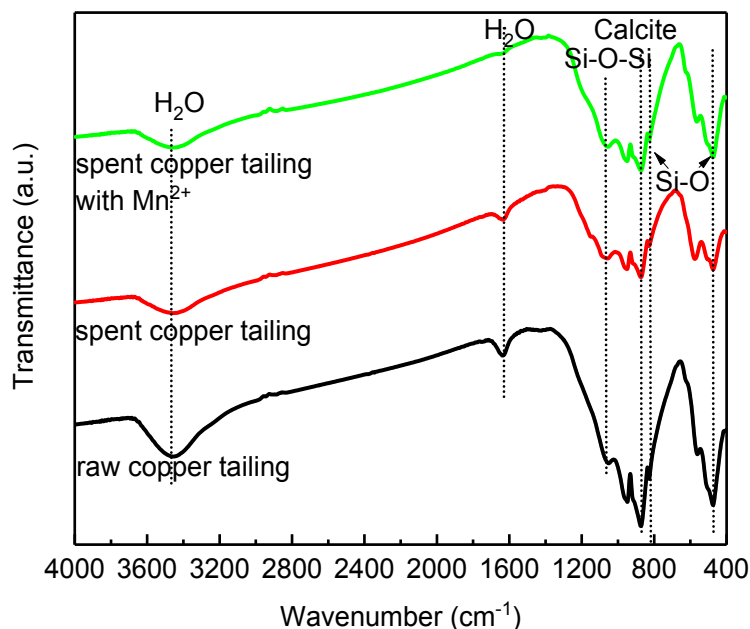
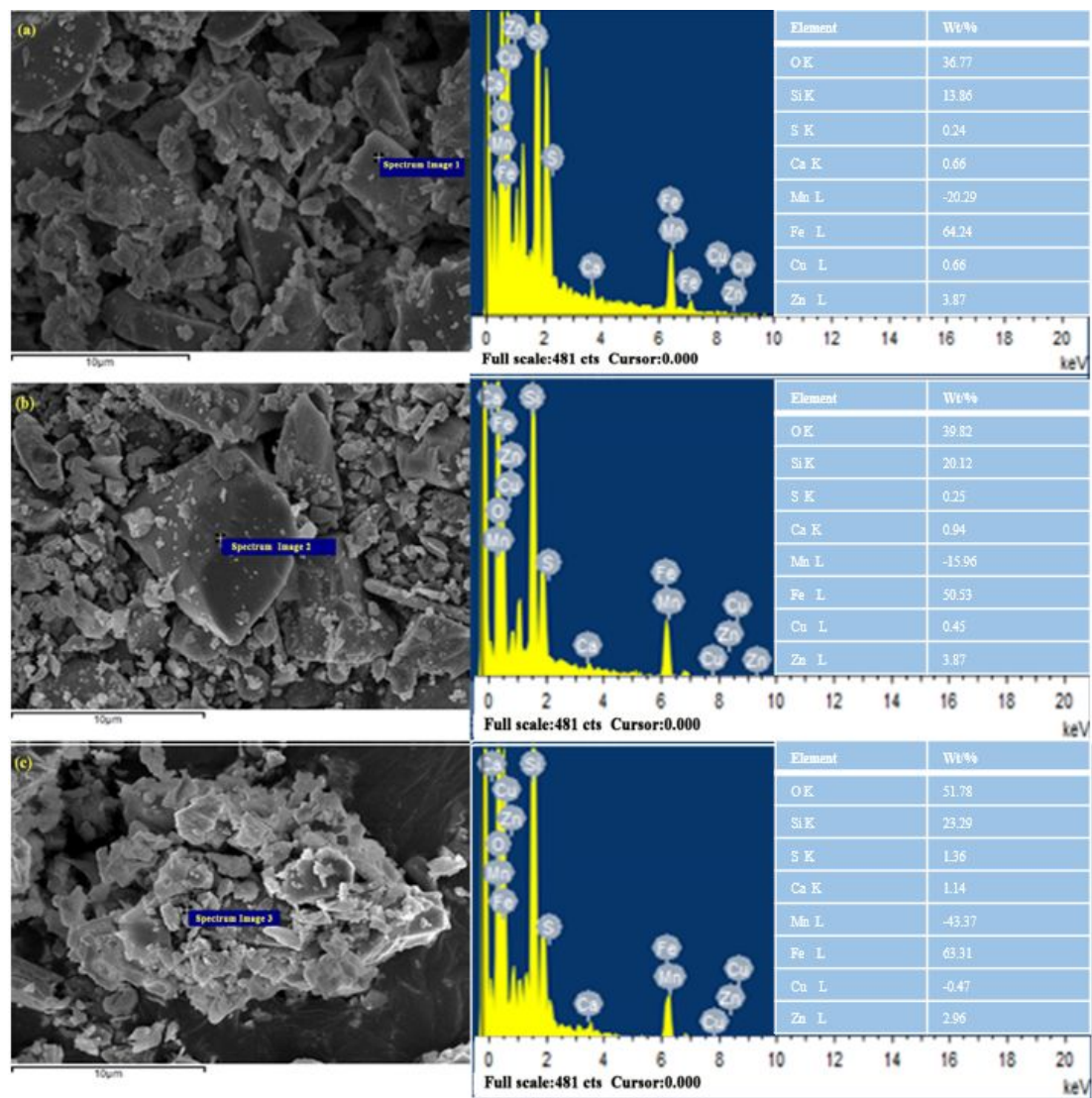


Figure S2. FT-IR spectra of raw and spent copper tailings.

1 SEM-EDS



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3 **Figure S3.** SEM/EDS images of raw and spent copper tailing. (a) raw copper tailing,
4 (b) spent copper tailing after 10 h flue gas desulfurization, and (c) spent copper tailing
5 combined with Mn^{2+} after 10 h flue gas desulfurization.