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Supporting Information for

Comment on: "Investigating Earth's Formation History Through Copper & Sulfur Metal–Silicate Partitioning During Core-Mantle Differentiation" by Mahan et al. (2018)

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Tables S1 to S2

Additional Supporting Information (Files uploaded separately)

none

Introduction

Tables S1 and S2 are provided here. They show the standard data (Table S1) and simulation output (Table S2). See main text for information regarding simulations.

Standard	ρ (g cm^{-3})	Element	Mole fraction	E (eV)	Intensity	3σ
Copper	8.96	Cu	1.000	8047.8	5.89E-05	2.94E-07
Iron	7	Fe	1.000	6404.0	9.68E-05	3.71E-07
CFMAS basalt	3	O	0.611	524.9	5.14E-05	1.28E-06
CFMAS basalt	3	Mg	0.069	1253.7	1.94E-05	7.81E-07
CFMAS basalt	3	Al	0.095	1486.7	3.02E-05	9.76E-07
CFMAS basalt	3	Si	0.168	1740.0	5.48E-05	1.32E-06
CFMAS basalt	3	Ca	0.042	3691.7	1.52E-05	6.91E-07
CFMAS basalt	3	Fe	0.015	6404.0	3.24E-06	3.13E-07

Table S1. Intensities and 3σ uncertainty of the various characteristic X-ray energies from the simulated standards, along with their compositions and densities. All lines shown correspond to K-L3 transition ($K\alpha_1$) simulated at 20 kV on 1 mm cylindrical blocks using PENEPMA.

Transect (for Fig. 3a)								
x (μm)	Phase	Intensity	3σ	ZAF_{sample}/ZAF_{std}	wt.% Cu	wt.% Cu 1σ	wt.% CuO	wt.% CuO 1σ
-8	silicate	1.95E-07	3.80E-09	1.208	0.400	0.003	0.501	0.003
-6	silicate	2.04E-07	4.00E-09	1.208	0.419	0.003	0.524	0.003
-4	silicate	2.13E-07	4.26E-09	1.208	0.437	0.003	0.547	0.004
-2	metal	4.59E-07	9.16E-09	1.128	0.880	0.006	1.101	0.007
0	metal	5.54E-07	1.10E-08	1.128	1.062	0.007	1.329	0.009
2	metal	7.03E-07	1.39E-08	1.208	1.348	0.009	1.687	0.011
4	silicate	3.87E-07	7.56E-09	1.208	0.794	0.005	0.994	0.006
6	silicate	4.28E-07	8.40E-09	1.208	0.879	0.006	1.100	0.007
8	silicate	5.06E-07	1.01E-08	1.208	1.039	0.007	1.300	0.009

Detector position (for Fig. 3b)						
Detector no.	position	Intensity	3σ	ZAF_{sample}/ZAF_{std}	wt.% Cu	wt.% Cu 1σ
1	Annular	5.49E-07	5E-09	1.128	1.052	0.003
2	0°	4.80E-07	2.82E-08	1.128	0.920	0.018
3	90°	4.62E-07	2.76E-08	1.128	0.886	0.018
4	180°	4.80E-07	2.81E-08	1.128	0.920	0.018
5	270°	6.63E-07	3.31E-08	1.128	1.271	0.021

Table S2. Simulated Cu $K\alpha_1$ X-ray intensities and Cu concentrations from the PENEPMA simulation used to construct Figs. 3a and 3b. Wt.% compositions and matrix correction factors calculated in CalcZAF are also shown.