

Online Supplemental Materials

Detailed information about the chemical analyses of ceramics, slags, and iron is presented in these appendices.

OSM Table 1. Grain analyses and XRF analyses of ceramics

Sample	10	26	48	102	170	185	279	356	373	447	499
Element											
SiO ₂	71.5	71.1	68.5	73.1	68.9	69.0	65.0	72.2	68.1	62.2	63.0
TiO ₂	0.7	0.7	0.8	0.7	0.8	0.9	1.0	0.7	0.9	1.0	1.0
Al ₂ O ₃	14.8	15.6	17.0	13.6	17.3	16.6	18.4	14.8	16.9	19.2	17.9
Fe ₂ O ₃	6.7	6.7	6.9	6.0	6.5	7.3	9.0	6.2	6.9	10.5	9.9
MnO	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.2	0.1
MgO	1.9	1.5	1.7	1.9	2.2	1.4	1.9	1.7	2.2	2.0	1.9
CaO	1.4	1.4	1.9	1.6	1.6	1.8	1.5	1.5	2.0	1.6	3.2
K ₂ O	2.0	2.3	2.5	2.1	2.3	2.4	2.7	2.1	2.4	2.7	2.7
P ₂ O ₅	0.9	0.6	0.7	0.9	0.4	0.6	0.5	0.8	0.4	0.7	0.4
S	412.3	347.3	509.5	603.9	475.6	446.1	629.0	422.7	582.4	453.6	381.5
V	236.9	232.6	252.1	200.9	265.3	261.5	265.0	223.8	264.2	272.8	251.6
Cr	220.7	199.6	303.7	182.1	235.6	267.4	273.4	233.4	251.6	251.3	230.2
Ni	38.5	57.3	54.0	32.2	43.7	59.4	29.9	44.4	42.5	74.1	60.3
Cu	41.8	77.2	51.7	35.8	48.0	48.9	75.9	39.7	45.8	53.1	49.3
Zn	51.3	49.2	69.3	45.8	63.2	70.2	80.6	49.0	64.4	79.7	79.8
As	8.7	11.3	10.5	7.8	10.5	10.5	12.9	9.2	9.3	12.0	9.7
Rb	34.8	37.8	41.8	35.5	46.5	43.1	52.9	31.4	47.1	57.6	52.4
Sr	132.5	152.7	209.0	146.6	144.2	193.0	141.0	129.8	144.8	147.6	143.3
Y	19.9	20.8	24.0	22.6	23.3	23.9	25.6	21.3	22.7	26.8	24.6
Zr	137.2	135.3	172.1	150.9	205.9	183.9	212.6	136.4	196.0	207.7	200.8
Nb	7.2	7.5	9.2	7.2	9.5	9.5	11.1	7.7	9.2	12.9	10.7
Sn	19.8	23.4	31.7	19.6	26.3	28.8	22.5	19.3	25.8	LOD	21.2
Ba	915.0	1051.3	1181.1	778.5	598.4	1136.4	481.5	979.3	587.9	325.5	427.4
Th	15.2	14.4	20.6	13.0	17.3	20.1	20.3	12.1	17.5	22.2	22.1
Number of grains (mm)											
>0.02	1490	1765	3982	3511	4393	5538	3667	2458	5197		
>0.02-0.063	830	1122	2949	2595	3160	4443	2954	1670	3921		
>0.063-0.2	454	494	956	757	1087	1038	644	625	1127		
>0.2-0.63	173	124	70	143	136	50	63	151	136		
>0.63-2	32	26	6	19	10	7	6	12	13		
Percentage of grains/area (mm)											
>0.02mm	22.3	20.1	11.8	18.5	16	11.1	8.8	16	15.6		
>0.02-0.063	0.5	0.7	2	1.7	1.9	2.5	1.7	1.1	2.2		
>0.063-0.2	2.4	2.3	4.1	3.3	4.4	3.9	2.5	2.8	4.4		
>0.2-0.63	8.9	6.7	3.3	8.7	6.9	2.1	2.9	8.4	5.6		
>0.63-2	10.6	10.4	2.4	4.8	2.7	2.5	1.7	3.7	3.4		

OSM Table 2. ICP-AES and ICP-MS chemical analyses of slag (Fnr 55 and 668)

Element	unit	Sample 55	Sample 668	Element	Unit	Sample 65	Sample 668
SiO ₂	wt%	16.5	22.8	Ge	ppm	<5	<5
TiO ₂	wt%	0.19	0.12	As	ppm	1.1	11.7
Al ₂ O ₃	wt%	1.61	0.78	Se	ppm	0.7	0.6
Fe ₂ O ₃	wt%	84.2	79	Rb	ppm	2.1	1.9
MnO	wt%	0.02	0.09	Sr	ppm	17.5	30.4
MgO	wt%	0.09	0.37	Y	ppm	4.8	2.4
CaO	wt%	0.47	0.82	Zr	ppm	63	20
Na ₂ O	wt%	0.01	<0.01	Te	ppm	0.01	<0.01
K ₂ O	wt%	<0.01	0.07	Cs	ppm	0.06	0.04
Cr ₂ O ₃	wt%	0.01	0.01	Ba	ppm	46.5	39.1
P ₂ O ₅	wt%	0.06	0.12	La	ppm	4.2	2
SrO	wt%	<0.01	<0.01	Ce	ppm	9.4	3.7
BaO	wt%	0.01	0.01	Pr	ppm	1.06	0.4
C	wt%	0.16	0.04	Nd	ppm	3.9	1.6
S	wt%	0.04	0.04	Sm	ppm	0.84	0.43
Loss	wt%	-4.16	-4.26	Eu	ppm	0.2	0.09
Sum	wt%	99.01	99.93	Gd	ppm	0.92	0.32
Li	ppm	10	10	Tb	ppm	0.14	0.04
Be	ppm			Dy	ppm	0.83	0.43
Sc	ppm	4	3	Ho	ppm	0.18	0.08
V	ppm	873	1250	Er	ppm	0.44	0.23
Cr	ppm	90	40	Tm	ppm	0.06	0.05
Mn	ppm			Yb	ppm	0.41	0.27
Co	ppm	<1	5	Lu	ppm	0.06	0.03
Ni	ppm	15	44	Hf	ppm	2.1	0.7
Cu	ppm	12	51	Ta	ppm	<0.1	<0.1
Nb	ppm	1.3	0.5	W	ppm	44	8
Mo	ppm	10	7	Re	ppm	<0.001	<0.001
Ag	ppm	<0.5	<0.5	Hg	ppm	<0.005	<0.005
Cd	ppm	<0.5	<0.5	Tl	ppm	<0.02	<0.02
In	ppm	<0.005	<0.005	Pb	ppm	3	4
Sn	ppm	1	1	Bi	ppm	<0.01	<0.01
Sb	ppm	0.25	0.74	Th	ppm	3.99	0.91
Zn	ppm	<2	<2	U	ppm	1.88	0.46
Ga	ppm	3.2	1.6				

OSM Table 3. Microsond data of analyzed iron (Fnr 668)

Weight-%	MP 03	MP 04	MP 05	MP 06	MP 07	MP 08	MP 09	MP 10	MP 11	MP 12
Na ₂ O	0.01	0.35	0.04	0	0.01	0.01	0	0	0.03	0.01
SiO ₂	29.3	34.1	25.5	29	0.01	0	0	0.01	0	0
Al ₂ O ₃	0.05	5.13	4.03	0.04	0	0	0	0	0	0
MgO	0.44	0.04	0.16	1.23	0	0.01	0	0	0	0
K ₂ O	0	1.46	0.06	0	0.01	0	0	0	0	0
P ₂ O ₅	0.14	2.8	0.89	0.48	0.01	0	0	0	0	0
CaO	1.42	13.4	2.14	0.81	0.01	0.02	0.01	0	0	0
TiO ₂	0	0.33	0.1	0	0.01	0	0	0	0	0
NiO	0	0	0	0	0.03	0.03	0.06	0.06	0.01	0
FeO	69.7	39.8	56.4	68.7	98.8	94.6	95.3	94.8	102	95.6
MnO	0.23	0.12	0.09	0.21	0	0	0	0.01	0	0
Cr ₂ O ₃	0	0.01	0.03	0.02	0	0	0	0	0	0
V ₂ O ₃	0	0	0.02	0.01	0	0	0	0	0	0
Total	101	97.5	89.4	100	98.9	94.6	95.4	94.9	102	95.6
Description of sampling point	Olivine crystal	glass and microcrystal olivine	glass and microcrystal olivine	Olivine crystal	Iron	Iron	Iron	Iron	Iron	Iron