

Supplementary material for: Archaeometallurgical study of a 16th-17th century “rapier” sword manufactured in Caino (northern Italy).

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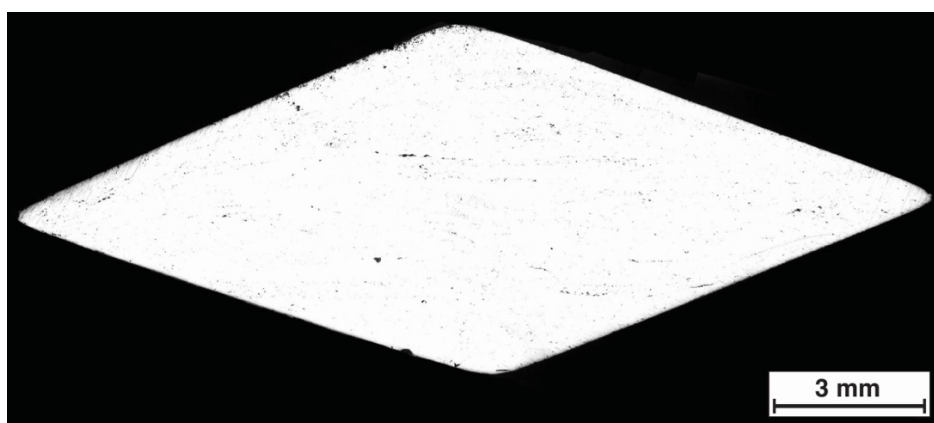


Figure S-1 As-polished S4 section (collage of micrographs with 50X magnification).



Figure S-2 As-polished S6 section (collage of micrographs with 50X magnification).

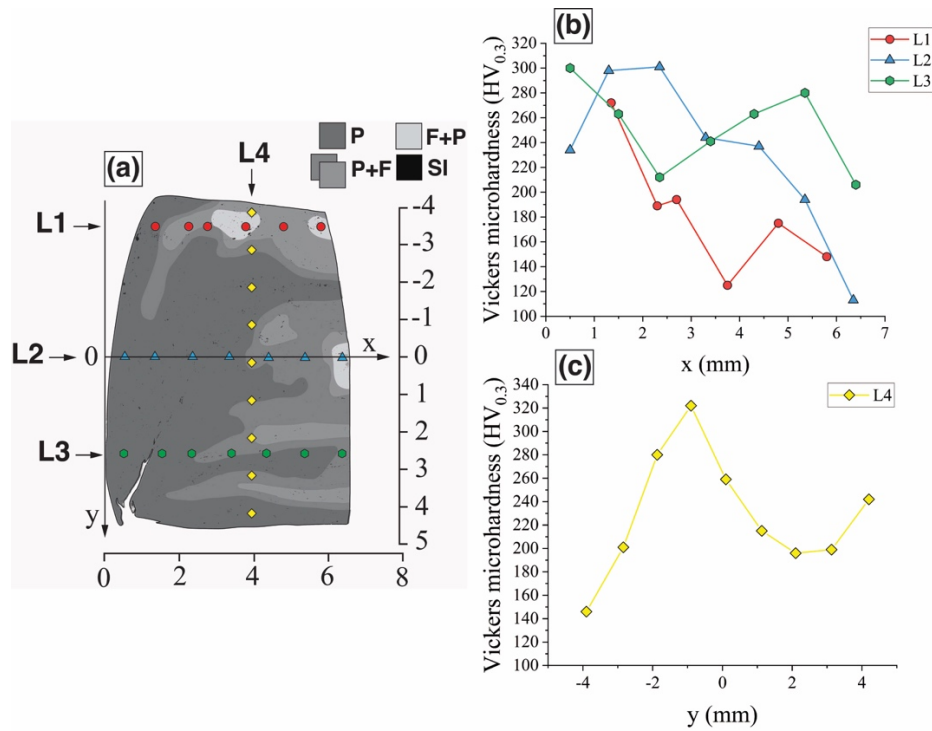


Figure S-3 (a) Distribution map of Vickers microhardness indentations on S1 section and resulting measurements along (b) horizontal (L1, L2, L3) and (c) vertical (L4) lines.

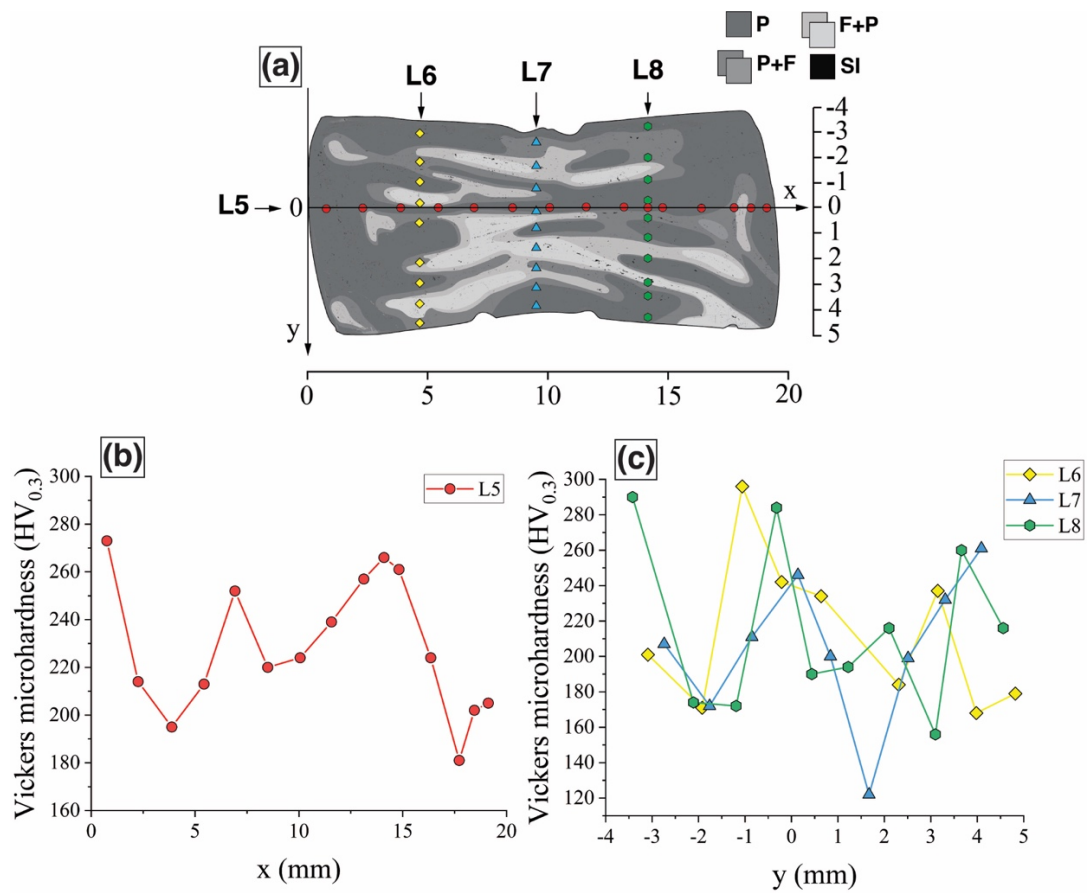


Figure S-4 (a) Distribution map of Vickers microhardness indentations on S2 section and resulting measurements along (b) horizontal (L5) and (c) vertical (L6, L7, L8) lines.

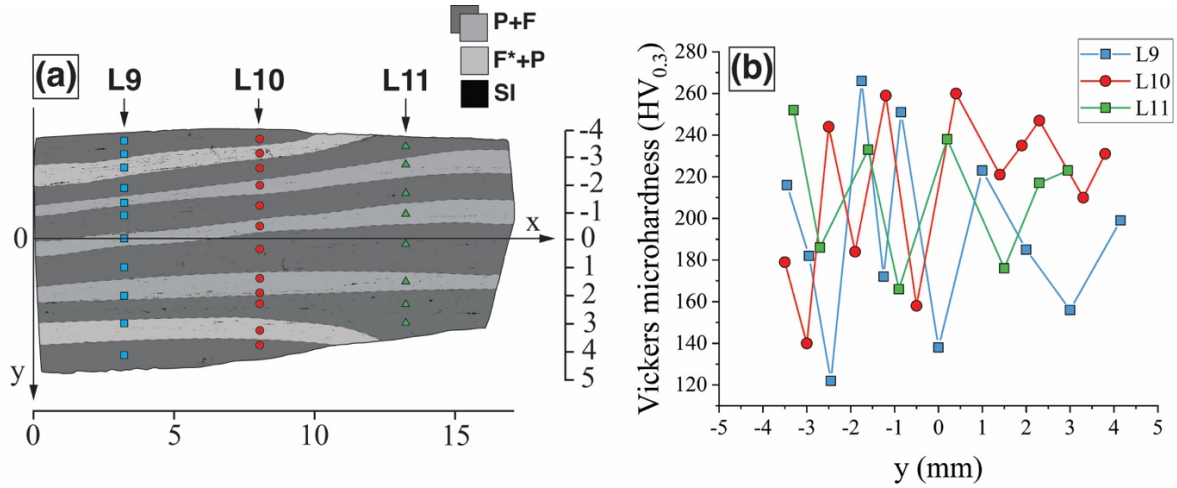


Figure S-5 (a) Distribution map of Vickers microhardness indentations on S3 section and resulting measurements along (b) vertical (L9, L10, L11) lines.

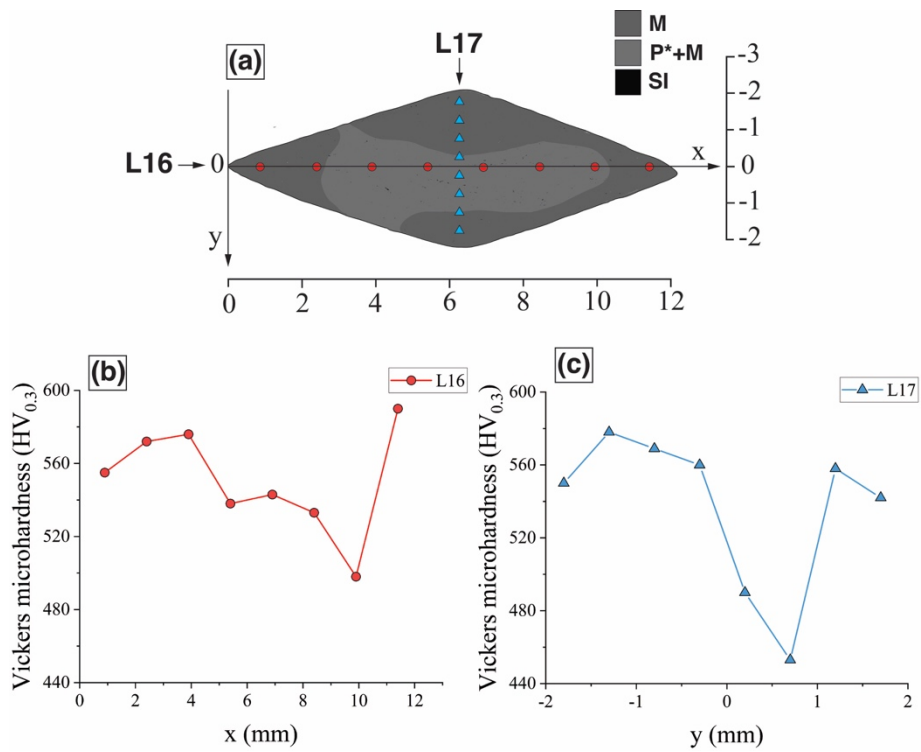


Figure S-6 (a) Distribution map of Vickers microhardness indentations on S5 section and resulting measurements along (b) horizontal (L16) and (c) vertical (L17) lines.

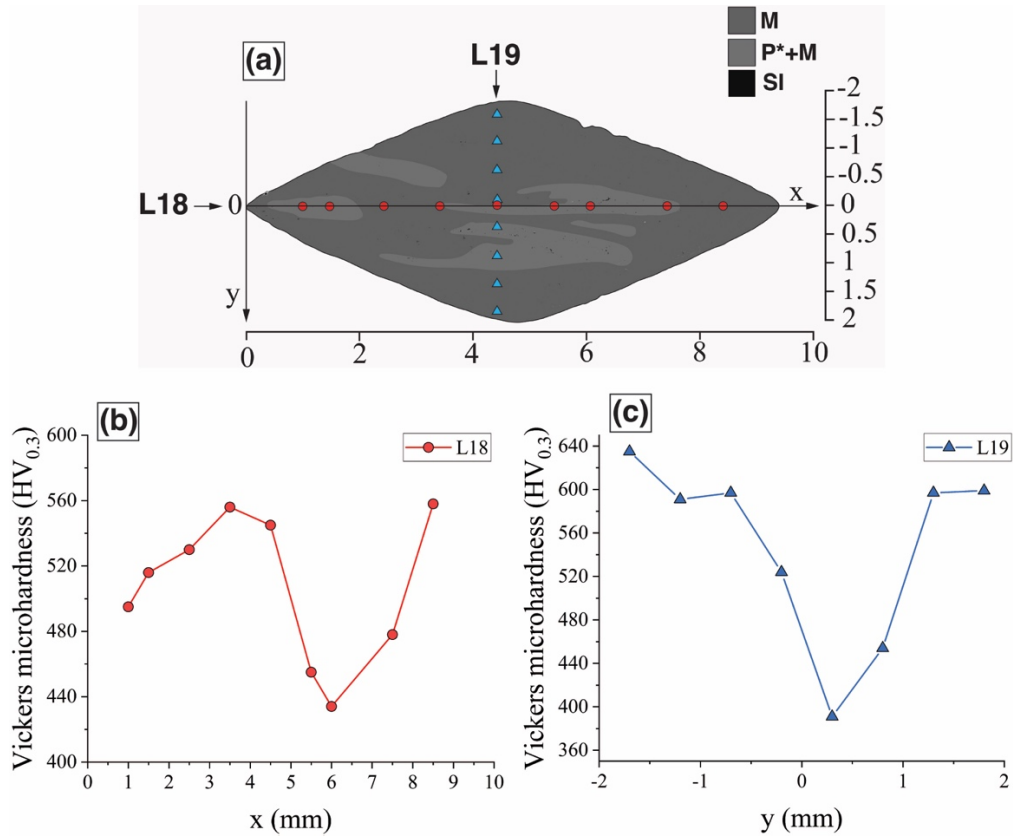


Figure S-7 (a) Distribution map of Vickers microhardness indentations on S6 section and resulting measurements along (b) horizontal (L18) and (c) vertical (L19) lines.

Table S-I. Vickers microhardness results (N=sample amplitude, Min=minimum value, Max=maximum value, $\bar{x}$ =mean value, s=sample standard deviation).

Section	Microstructure	N	Min	Max	$\bar{x}$	s
S1	P	14	234	322	274	26
S1	P+F	11	175	241	204	20
S1	F*+P	4	113	148	133	17
S2	P	25	199	296	241	28
S2	P+F	14	171	214	192	16
S2	F+P	4	122	172	155	23
S3	P+F	27	138	266	213	36
S3	F*+P	4	122	210	157	38
S4	P**+M+F	4	316	340	332	11
S4	P**+F	8	192	253	222	25
S4	P+F	20	181	265	218	26
S4	F+P	8	173	217	191	16
S5	M	9	542	590	564	15
S5	P*+M	7	453	576	519	41

S6	P*+M	8	391	524	468	44
S6	M	9	530	635	579	33

Table S-II. Elemental chemical composition (Wt Pct) for each SI analyzed by SEM/EDS.

N	O (Wt Pct)	Na (Wt Pct)	Mg (Wt Pct)	Al (Wt Pct)	Si (Wt Pct)	K (Wt Pct)	Ca (Wt Pct)	Ti (Wt Pct)	Mn (Wt Pct)	Fe (Wt Pct)	S (Wt Pct)	P (Wt Pct)
1	53.89	0.63	2.17	4.49	20.23	2.40	5.46	0.32	2.65	7.77	0.00	0.00
2	51.21	0.71	3.17	8.08	18.30	2.85	9.31	0.48	1.16	4.73	0.00	0.00
3	49.93	0.60	0.70	4.13	20.12	1.77	6.10	0.27	8.22	8.16	0.00	0.00
4	50.42	0.48	0.86	4.01	19.65	1.71	6.12	0.34	8.71	7.71	0.00	0.00
5	52.97	0.67	1.41	3.51	24.59	1.98	5.51	0.25	3.57	5.55	0.00	0.00
6	54.07	0.71	1.07	3.56	24.46	2.03	5.36	0.18	3.40	5.16	0.00	0.00
7	50.14	0.19	1.16	2.49	20.41	1.17	3.87	0.22	0.85	19.51	0.00	0.00
8	54.48	0.67	1.61	3.71	25.97	1.82	5.61	0.22	3.84	2.07	0.00	0.00
9	53.81	0.49	1.47	3.74	25.52	1.65	5.93	0.31	4.51	2.36	0.22	0.00
10	54.32	0.34	1.45	3.68	24.97	1.45	6.30	0.14	2.41	4.95	0.00	0.00
11	53.48	0.58	1.24	3.59	25.02	1.56	6.46	0.25	2.28	5.54	0.00	0.00
12	54.16	0.47	1.48	3.40	24.13	1.59	5.46	0.25	1.82	7.26	0.00	0.00
13	50.82	0.34	0.87	2.39	20.28	1.08	3.89	0.36	0.66	19.13	0.19	0.00
14	53.27	0.58	2.48	4.75	21.41	3.59	7.35	0.31	4.16	2.09	0.00	0.00
15	46.36	0.35	1.97	2.88	14.42	1.58	4.18	0.24	18.69	9.32	0.00	0.00
16	49.12	0.67	1.42	3.93	18.42	3.52	3.49	0.25	12.54	6.43	0.21	0.00
17	33.42	0.00	0.99	0.26	0.00	0.00	0.00	0.00	9.70	55.64	0.00	0.00
18	41.21	0.24	4.41	2.33	11.93	1.40	1.60	0.04	17.37	19.47	0.00	0.00
19	52.60	0.87	3.11	6.15	20.59	3.67	7.14	0.36	3.29	2.22	0.00	0.00
20	33.17	0.00	0.72	0.35	0.00	0.00	0.00	0.00	4.80	60.96	0.00	0.00
21	37.22	0.04	1.04	0.45	2.69	0.13	0.84	0.00	4.02	53.53	0.05	0.00
22	51.38	0.47	1.66	4.29	19.21	2.66	5.43	0.26	12.84	1.78	0.00	0.00
23	50.77	0.87	1.37	4.56	19.35	2.76	5.56	0.38	12.22	2.17	0.00	0.00
24	33.06	0.00	2.27	0.00	0.00	0.00	0.00	0.00	19.80	44.87	0.00	0.00
25	34.66	0.00	0.81	0.03	1.12	0.03	0.15	0.00	4.91	58.30	0.00	0.00
26	37.15	0.00	5.53	0.88	2.95	0.00	0.56	0.07	44.97	7.88	0.00	0.00
27	33.37	0.00	1.32	0.23	0.51	0.12	0.10	0.00	10.81	53.53	0.00	0.00
28	36.27	0.00	5.20	0.32	1.94	0.00	0.50	0.02	39.43	16.30	0.00	0.00
29	48.05	0.49	1.96	2.79	14.17	1.67	4.25	0.27	19.24	7.11	0.00	0.00
30	37.64	0.15	1.92	0.83	4.57	0.75	1.26	0.00	18.19	34.70	0.00	0.00
31	52.60	0.41	3.42	4.48	19.24	3.08	6.04	0.36	8.16	2.23	0.00	0.00
32	52.88	0.60	1.53	4.67	20.65	2.94	5.70	0.25	5.07	5.70	0.00	0.00
33	51.61	0.00	1.04	2.64	20.34	0.93	4.21	0.00	0.85	18.40	0.00	0.00
34	48.43	0.75	0.93	3.51	13.98	2.30	3.44	0.25	10.66	15.21	0.00	0.52
35	51.03	0.60	2.33	4.07	17.73	2.89	8.21	0.30	3.17	9.66	0.00	0.00
36	54.09	0.49	1.27	2.87	23.09	1.40	3.77	0.15	0.72	12.16	0.00	0.00
37	55.34	0.52	1.61	3.38	25.19	1.51	5.58	0.27	2.02	4.57	0.00	0.00
38	55.29	0.34	1.48	3.77	25.43	1.94	6.25	0.00	2.36	3.15	0.00	0.00
39	51.97	0.00	0.88	2.64	21.14	1.22	3.30	0.33	0.82	17.70	0.00	0.00
40	51.58	0.65	1.16	4.19	18.99	3.14	4.88	0.00	12.02	3.40	0.00	0.00
41	49.84	0.51	2.09	5.31	19.14	3.41	5.74	0.43	4.39	9.15	0.00	0.00

42	40.71	0.00	1.72	0.16	7.97	0.00	0.78	0.00	8.08	40.58	0.00	0.00
43	34.40	0.00	0.60	0.22	1.01	0.00	0.07	0.00	5.76	57.94	0.00	0.00
44	54.03	0.99	2.39	5.56	20.73	3.06	6.83	0.26	3.36	2.79	0.00	0.00
45	43.71	0.30	1.93	3.16	10.33	1.85	2.24	0.15	17.83	18.50	0.00	0.00
46	53.12	0.78	0.92	5.80	19.79	2.96	5.06	0.25	7.75	3.58	0.00	0.00
47	43.94	0.00	1.11	2.40	9.80	1.20	2.38	0.10	10.57	28.49	0.00	0.00
48	51.52	0.51	1.51	3.68	18.17	2.10	5.03	0.34	13.82	3.31	0.00	0.00
49	46.23	0.00	3.99	4.04	11.11	0.98	4.07	0.36	20.97	8.25	0.00	0.00
50	44.72	0.00	1.74	1.58	11.78	1.49	3.39	0.00	22.69	12.37	0.00	0.24
51	50.82	0.44	4.31	3.48	16.98	2.39	4.66	0.32	14.50	2.10	0.00	0.00
52	46.07	0.24	0.62	1.97	13.52	1.01	2.90	0.00	0.68	32.73	0.00	0.27
53	45.49	0.27	1.08	1.98	12.92	0.78	2.81	0.09	0.35	34.09	0.00	0.14
54	50.36	0.52	0.98	2.84	20.45	1.40	5.11	0.15	2.01	16.16	0.00	0.00
55	53.79	0.53	1.67	4.26	24.04	2.24	6.05	0.30	4.87	2.25	0.00	0.00
56	48.90	0.00	1.84	5.14	22.00	3.00	5.46	0.00	10.88	2.77	0.00	0.00
57	27.85	0.00	3.52	0.00	0.00	0.00	0.00	0.00	41.50	27.13	0.00	0.00
58	43.99	0.00	1.58	4.36	19.25	2.64	4.49	0.00	15.97	7.71	0.00	0.00
59	54.43	0.00	0.00	4.62	27.68	4.46	1.63	0.00	3.17	4.01	0.00	0.00
60	40.29	0.00	0.91	2.32	15.03	0.99	3.58	0.00	0.00	36.88	0.00	0.00
61	40.00	0.00	0.00	2.46	14.69	1.45	3.91	0.00	1.58	35.91	0.00	0.00
62	34.45	0.00	2.96	1.89	12.91	1.71	2.85	0.00	15.58	26.78	0.00	0.88
63	44.52	0.00	2.08	4.47	19.61	2.88	4.99	0.00	18.42	3.03	0.00	0.00
64	52.73	0.00	3.21	6.36	22.04	4.48	8.01	0.00	3.16	0.00	0.00	0.00
65	27.54	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.95	64.51	0.00	0.00
66	44.53	0.00	2.51	5.50	23.05	3.09	5.96	0.00	7.12	8.25	0.00	0.00
67	48.78	0.00	2.51	6.97	23.54	3.91	6.39	0.00	5.47	2.44	0.00	0.00
68	51.20	0.00	2.19	4.72	29.25	2.79	6.73	0.00	3.11	0.00	0.00	0.00
69	53.58	0.00	1.74	4.23	27.75	2.00	6.27	0.00	2.60	1.84	0.00	0.00
70	44.24	0.00	3.63	5.65	18.66	2.15	5.51	0.00	16.99	2.55	0.62	0.00
71	53.45	0.00	0.00	4.77	31.44	5.03	0.98	0.00	2.46	1.88	0.00	0.00
72	29.55	0.00	1.44	4.03	10.42	2.79	2.54	0.00	7.01	40.79	0.00	1.43
73	50.55	0.00	2.12	4.25	27.07	2.56	6.89	0.00	4.88	1.68	0.00	0.00
74	44.24	0.00	0.00	4.22	16.48	1.76	5.34	0.00	0.00	27.97	0.00	0.00
75	44.68	0.00	1.72	4.53	21.72	2.88	4.98	0.00	15.54	3.95	0.00	0.00
76	51.67	0.00	2.67	4.79	23.60	2.57	6.53	0.00	6.24	1.94	0.00	0.00
77	30.05	0.00	4.84	0.90	2.36	0.44	0.65	0.00	34.40	26.16	0.00	0.19
78	41.01	0.00	1.70	5.04	20.84	3.76	5.73	0.00	10.40	11.53	0.00	0.00
79	35.86	0.00	0.00	2.38	14.78	1.37	4.52	0.00	1.42	39.67	0.00	0.00
80	49.23	0.98	2.10	6.66	24.46	3.32	6.43	0.00	4.72	2.11	0.00	0.00
81	48.93	0.00	2.49	6.74	23.86	4.22	9.70	0.00	2.48	1.58	0.00	0.00
82	47.10	0.00	2.10	4.81	22.43	2.39	5.91	0.00	12.55	2.71	0.00	0.00
83	39.80	0.00	0.00	1.76	12.81	0.83	2.98	0.00	0.00	41.81	0.00	0.00
84	29.80	0.00	6.84	0.19	1.31	0.00	0.36	0.00	50.51	10.99	0.00	0.00
85	49.11	0.97	2.11	6.10	25.07	4.28	5.87	0.00	4.54	1.94	0.00	0.00
86	41.25	0.00	0.00	3.79	16.60	1.09	4.50	0.00	0.00	32.77	0.00	0.00
87	38.85	0.00	1.64	4.92	20.70	3.01	5.14	0.00	8.31	17.44	0.00	0.00
88	38.03	0.00	1.13	3.12	14.46	0.65	3.61	0.00	1.65	37.35	0.00	0.00
89	49.34	0.00	2.73	6.83	24.19	4.16	8.26	0.00	2.99	1.50	0.00	0.00
90	46.26	0.00	1.68	4.20	24.24	1.63	5.42	0.00	10.61	5.95	0.00	0.00

91	51.03	0.00	2.46	5.78	23.71	3.01	7.44	0.00	6.58	0.00	0.00	0.00
92	42.47	0.00	11.79	0.00	15.99	0.00	1.54	0.00	23.40	4.80	0.00	0.00
93	43.87	0.00	2.43	3.98	18.71	2.27	5.36	0.00	19.46	3.93	0.00	0.00
94	49.41	0.00	3.26	5.04	22.03	2.17	6.41	0.00	9.96	1.72	0.00	0.00
95	48.06	0.00	2.07	4.12	20.18	1.56	5.95	0.00	15.77	2.29	0.00	0.00
96	48.85	0.00	1.84	4.43	18.16	1.75	4.81	0.00	15.65	4.50	0.00	0.00

Table S-III. Elemental chemical composition (At Pct) for each SI analyzed by SEM/EDS.

N	O (At Pct)	Na (At Pct)	Mg (At Pct)	Al (At Pct)	Si (At Pct)	K (At Pct)	Ca (At Pct)	Ti (At Pct)	Mn (At Pct)	Fe (At Pct)	S (At Pct)	P (At Pct)
1	70.72	0.58	1.87	3.49	15.12	1.29	2.86	0.14	1.01	2.92	0.00	0.00
2	67.62	0.65	2.75	6.32	13.76	1.54	4.90	0.21	0.45	1.79	0.00	0.00
3	68.69	0.57	0.63	3.37	15.76	1.00	3.35	0.12	3.29	3.21	0.00	0.00
4	69.18	0.46	0.78	3.26	15.35	0.96	3.35	0.16	3.48	3.03	0.00	0.00
5	69.55	0.61	1.22	2.73	18.38	1.06	2.89	0.11	1.36	2.09	0.00	0.00
6	70.40	0.64	0.92	2.75	18.14	1.08	2.78	0.08	1.29	1.92	0.00	0.00
7	69.58	0.18	1.06	2.05	16.13	0.66	2.14	0.10	0.34	7.75	0.00	0.00
8	70.06	0.60	1.36	2.83	19.02	0.96	2.88	0.09	1.44	0.76	0.00	0.00
9	69.78	0.44	1.25	2.87	18.85	0.88	3.07	0.13	1.70	0.88	0.14	0.00
10	70.38	0.31	1.24	2.83	18.42	0.77	3.26	0.06	0.91	1.84	0.00	0.00
11	69.80	0.53	1.06	2.78	18.59	0.83	3.36	0.11	0.87	2.07	0.00	0.00
12	70.58	0.43	1.27	2.63	17.91	0.85	2.84	0.11	0.69	2.71	0.00	0.00
13	70.12	0.33	0.79	1.95	15.94	0.61	2.14	0.17	0.27	7.56	0.13	0.00
14	69.52	0.53	2.13	3.67	15.91	1.92	3.83	0.14	1.58	0.78	0.00	0.00
15	67.86	0.36	1.90	2.50	12.02	0.95	2.44	0.12	7.96	3.91	0.00	0.00
16	68.37	0.65	1.30	3.24	14.60	2.00	1.94	0.12	5.08	2.56	0.15	0.00
17	63.08	0.00	1.23	0.29	0.00	0.00	0.00	0.00	5.33	30.07	0.00	0.00
18	64.09	0.26	4.51	2.14	10.57	0.89	0.99	0.02	7.86	8.67	0.00	0.00
19	68.59	0.79	2.67	4.75	15.29	1.96	3.71	0.16	1.25	0.83	0.00	0.00
20	62.94	0.00	0.90	0.39	0.00	0.00	0.00	0.00	2.65	33.12	0.00	0.00
21	65.72	0.04	1.21	0.47	2.70	0.09	0.59	0.00	2.07	27.06	0.04	0.00
22	69.56	0.44	1.48	3.44	14.81	1.47	2.93	0.12	5.06	0.69	0.00	0.00
23	68.94	0.82	1.22	3.67	14.96	1.53	3.01	0.17	4.83	0.84	0.00	0.00
24	62.19	0.00	2.81	0.00	0.00	0.00	0.00	0.00	10.84	24.16	0.00	0.00
25	64.14	0.00	0.99	0.03	1.18	0.02	0.11	0.00	2.64	30.89	0.00	0.00
26	63.42	0.00	6.21	0.89	2.87	0.00	0.38	0.04	22.34	3.85	0.00	0.00
27	62.69	0.00	1.63	0.26	0.55	0.09	0.07	0.00	5.91	28.79	0.00	0.00
28	63.26	0.00	5.97	0.34	1.93	0.00	0.35	0.01	20.01	8.14	0.00	0.00
29	69.13	0.49	1.85	2.38	11.61	0.98	2.44	0.13	8.06	2.93	0.00	0.00
30	64.74	0.18	2.17	0.84	4.47	0.53	0.87	0.00	9.10	17.09	0.00	0.00
31	69.62	0.38	2.98	3.51	14.50	1.67	3.19	0.16	3.14	0.85	0.00	0.00
32	70.04	0.55	1.33	3.67	15.58	1.59	3.01	0.11	1.95	2.16	0.00	0.00
33	70.68	0.00	0.94	2.14	15.86	0.52	2.30	0.00	0.34	7.21	0.00	0.00
34	69.46	0.75	0.88	2.98	11.42	1.35	1.97	0.12	4.45	6.25	0.00	0.38
35	69.21	0.57	2.08	3.27	13.69	1.60	4.44	0.14	1.25	3.75	0.00	0.00

36	71.23	0.45	1.10	2.24	17.32	0.75	1.98	0.07	0.28	4.58	0.00	0.00
37	71.00	0.46	1.36	2.57	18.40	0.79	2.86	0.12	0.75	1.68	0.00	0.00
38	70.80	0.30	1.25	2.86	18.54	1.02	3.19	0.00	0.88	1.15	0.00	0.00
39	70.82	0.00	0.79	2.13	16.40	0.68	1.79	0.15	0.33	6.91	0.00	0.00
40	69.90	0.61	1.03	3.37	14.65	1.74	2.64	0.00	4.74	1.32	0.00	0.00
41	67.96	0.48	1.87	4.29	14.86	1.90	3.12	0.20	1.74	3.57	0.00	0.00
42	67.00	0.00	1.86	0.15	7.47	0.00	0.51	0.00	3.87	19.12	0.00	0.00
43	63.95	0.00	0.74	0.24	1.07	0.00	0.05	0.00	3.11	30.84	0.00	0.00
44	69.96	0.89	2.04	4.27	15.28	1.62	3.53	0.11	1.27	1.03	0.00	0.00
45	67.11	0.32	1.95	2.88	9.03	1.16	1.37	0.08	7.97	8.13	0.00	0.00
46	70.29	0.72	0.80	4.55	14.91	1.60	2.67	0.11	2.98	1.36	0.00	0.00
47	68.25	0.00	1.13	2.21	8.67	0.76	1.47	0.05	4.78	12.67	0.00	0.00
48	70.24	0.48	1.35	2.97	14.11	1.17	2.74	0.15	5.48	1.29	0.00	0.00
49	67.80	0.00	3.85	3.51	9.28	0.59	2.38	0.18	8.95	3.46	0.00	0.00
50	68.03	0.00	1.74	1.42	10.20	0.93	2.06	0.00	10.05	5.39	0.00	0.19
51	69.18	0.42	3.86	2.81	13.16	1.33	2.53	0.15	5.75	0.82	0.00	0.00
52	68.98	0.25	0.61	1.75	11.53	0.62	1.73	0.00	0.30	14.03	0.00	0.21
53	68.59	0.28	1.07	1.77	11.09	0.48	1.69	0.04	0.15	14.72	0.00	0.11
54	69.40	0.50	0.89	2.32	16.05	0.79	2.81	0.07	0.81	6.38	0.00	0.00
55	69.89	0.48	1.43	3.28	17.79	1.19	3.14	0.13	1.84	0.84	0.00	0.00
56	66.94	0.00	1.66	4.17	17.15	1.68	2.98	0.00	4.33	1.09	0.00	0.00
57	55.69	0.00	4.63	0.00	0.00	0.00	0.00	0.00	24.15	15.53	0.00	0.00
58	64.41	0.00	1.52	3.78	16.05	1.58	2.62	0.00	6.81	3.23	0.00	0.00
59	70.25	0.00	0.00	3.53	20.34	2.35	0.84	0.00	1.19	1.48	0.00	0.00
60	63.74	0.00	0.95	2.18	13.54	0.64	2.26	0.00	0.00	16.70	0.00	0.00
61	63.78	0.00	0.00	2.32	13.34	0.95	2.49	0.00	0.73	16.39	0.00	0.00
62	58.04	0.00	3.28	1.88	12.39	1.18	1.91	0.00	7.64	12.92	0.00	0.76
63	64.43	0.00	1.98	3.83	16.16	1.70	2.88	0.00	7.76	1.26	0.00	0.00
64	68.38	0.00	2.74	4.89	16.28	2.38	4.14	0.00	1.19	0.00	0.00	0.00
65	56.99	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.79	38.22	0.00	0.00
66	63.04	0.00	2.34	4.61	18.58	1.79	3.37	0.00	2.93	3.34	0.00	0.00
67	65.56	0.00	2.22	5.55	18.02	2.15	3.43	0.00	2.14	0.94	0.00	0.00
68	66.64	0.00	1.88	3.64	21.68	1.49	3.49	0.00	1.18	0.00	0.00	0.00
69	69.01	0.00	1.47	3.23	20.35	1.05	3.22	0.00	0.97	0.68	0.00	0.00
70	63.51	0.00	3.43	4.81	15.25	1.26	3.16	0.00	7.10	1.05	0.44	0.00
71	68.63	0.00	0.00	3.63	22.99	2.64	0.50	0.00	0.92	0.69	0.00	0.00
72	53.31	0.00	1.71	4.31	10.70	2.06	1.83	0.00	3.68	21.07	0.00	1.33
73	66.89	0.00	1.85	3.33	20.40	1.39	3.64	0.00	1.88	0.64	0.00	0.00
74	66.05	0.00	0.00	3.73	14.01	1.07	3.18	0.00	0.00	11.96	0.00	0.00
75	64.12	0.00	1.62	3.85	17.75	1.69	2.85	0.00	6.49	1.62	0.00	0.00
76	68.23	0.00	2.32	3.75	17.75	1.39	3.44	0.00	2.40	0.73	0.00	0.00
77	56.53	0.00	5.99	1.01	2.53	0.34	0.49	0.00	18.84	14.09	0.00	0.18
78	61.09	0.00	1.67	4.45	17.68	2.29	3.41	0.00	4.51	4.92	0.00	0.00
79	59.95	0.00	0.00	2.36	14.07	0.94	3.01	0.00	0.69	18.99	0.00	0.00
80	65.58	0.91	1.84	5.26	18.55	1.81	3.42	0.00	1.83	0.80	0.00	0.00
81	65.31	0.00	2.19	5.33	18.14	2.30	5.17	0.00	0.96	0.60	0.00	0.00
82	65.54	0.00	1.92	3.97	17.77	1.36	3.28	0.00	5.08	1.08	0.00	0.00
83	64.57	0.00	0.00	1.69	11.83	0.55	1.93	0.00	0.00	19.42	0.00	0.00
84	56.07	0.00	8.47	0.21	1.41	0.00	0.27	0.00	27.66	5.92	0.00	0.00

85	65.45	0.90	1.85	4.82	19.03	2.33	3.12	0.00	1.76	0.74	0.00	0.00
86	63.88	0.00	0.00	3.48	14.64	0.69	2.78	0.00	0.00	14.53	0.00	0.00
87	59.47	0.00	1.65	4.46	18.04	1.88	3.14	0.00	3.70	7.64	0.00	0.00
88	61.60	0.00	1.20	3.00	13.34	0.43	2.33	0.00	0.78	17.32	0.00	0.00
89	65.56	0.00	2.39	5.38	18.30	2.26	4.38	0.00	1.16	0.57	0.00	0.00
90	64.90	0.00	1.55	3.49	19.37	0.94	3.03	0.00	4.33	2.39	0.00	0.00
91	67.42	0.00	2.14	4.53	17.84	1.63	3.92	0.00	2.53	0.00	0.00	0.00
92	62.34	0.00	11.38	0.00	13.36	0.00	0.90	0.00	10.00	2.02	0.00	0.00
93	64.20	0.00	2.34	3.45	15.59	1.36	3.13	0.00	8.29	1.65	0.00	0.00
94	66.84	0.00	2.90	4.04	16.97	1.20	3.46	0.00	3.92	0.67	0.00	0.00
95	67.11	0.00	1.90	3.41	16.05	0.89	3.31	0.00	6.41	0.92	0.00	0.00
96	68.32	0.00	1.69	3.67	14.46	1.00	2.68	0.00	6.37	1.80	0.00	0.00

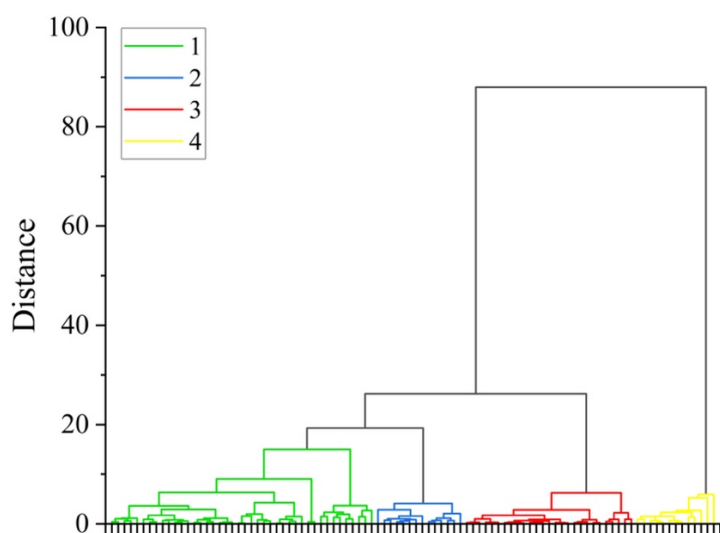


Figure S-8 Dendrogram plot from HCA analysis.

Table S-IV. Area (μm^2) of each analyzed SI, categorized by number (N) and PCA/HCA group.

N	Group	Area (μm^2)
1	1	205
2	1	2973
3	1	2973
4	1	217
5	1	1165
6	1	43
7	1	1628
8	1	10342
9	1	685
10	1	400

11	1	480
12	1	783
13	1	273
14	1	375
15	1	854
16	1	623
17	1	280
18	1	361
19	1	5476
20	1	112
21	1	239
22	1	1750
23	1	1711
24	1	283
25	1	5300
26	1	943
27	1	464
28	1	384
29	1	635
30	1	799
31	1	472
32	1	858
33	1	557
34	1	430
35	1	136
36	1	400
37	1	529
38	1	442
39	1	417
40	1	154
41	1	1653
42	1	3659
43	2	266
44	2	115
45	2	316
46	2	314
47	2	41
48	2	112
49	2	1296
50	2	227
51	2	343
52	2	904
53	2	560
54	2	92
55	2	416
56	2	79
57	3	210
58	3	182
59	3	894

60	3	1477
61	3	366
62	3	1128
63	3	744
64	3	1841
65	3	747
66	3	2013
67	3	1120
68	3	1749
69	3	1052
70	3	4230
71	3	1760
72	3	306
73	3	3775
74	3	5307
75	3	1109
76	3	295
77	3	164
78	3	803
79	3	480
80	3	1954
81	3	331
82	3	4521
83	3	1088
84	4	808
85	4	3404
86	4	1123
87	4	3549
88	4	125
89	4	717
90	4	604
91	4	2204
92	4	827
93	4	858
94	4	877
95	4	453
96	4	468

Details of MELTS calculations

The MELTS-rhyolite v.1.0.2 software package was used to compute the liquidus temperatures of smelting and forging-related SI.^[1,2] The modeling of liquidus temperatures was performed at atmospheric pressure (1 bar) and iron-wüstite (IW) oxygen fugacity buffer. The liquidus temperatures were estimated starting from 1500 °C. The input files referring to groups 1 (smelting-derived SI) and

3 (forging-derived SI) are named “MELTS INPUT FILE 1” and “MELTS INPUT FILE 2”, respectively. The amount of each oxide in the input files is expressed as a percentage by weight (wt pct).

MELTS INPUT FILE 1

Title: GROUP_1

Initial Composition: SiO₂ 48.4100

Initial Composition: TiO₂ 0.3200

Initial Composition: Al₂O₃ 8.8900

Initial Composition: Fe₂O₃ 0.4277

Initial Composition: FeO 10.4352

Initial Composition: MnO 16.9600

Initial Composition: MgO 3.0400

Initial Composition: CaO 7.5500

Initial Composition: Na₂O 0.4600

Initial Composition: K₂O 3.4800

Initial Composition: P₂O₅ 0.0500

Initial Temperature: 1500.00

Final Temperature: 1000.00

Initial Pressure: 1.00

Final Pressure: 1.00

Increment Temperature: -10.00

Increment Pressure: 0.00

dp/dt: -0.00

log fo₂ Path: IW

MELTS INPUT FILE 2

Title: GROUP_3

Initial Composition: SiO₂ 52.08

Initial Composition: Al₂O₃ 6.91

Initial Composition: TiO₂ 0.30

Initial Composition: FeO 25.69

Initial Composition: MnO 2.73

Initial Composition: MgO 1.98

Initial Composition: CaO 7.75

Initial Composition: K₂O 2.07

Initial Composition: P₂O₅ 0.04

Initial Temperature: 1800.00

Final Temperature: 1000.00

Initial Pressure: 1.00

Final Pressure: 1.00

Increment Temperature: 10.00

Increment Pressure: 0.00

dp/dt: 0.00

log fo₂ Path: IW

References

- 1 M.S. Ghiorso and G.A.R. Gualda: Contributions to Mineralogy and Petrology, 2015, vol. 169, pp. 1–30.
- 2 G.A.R. Gualda, M.S. Ghiorso, R. v. Lemons, and T.L. Carley: Journal of Petrology, 2012, vol. 53, pp. 875–90.