Table S3. Glass composition from Bronze Age metallurgical slags of South Ural

№	Object	Sample	Analyses	SiO_2	FeO	Al_2O_3	CaO	MgO	Na_2O	K_2O	TiO_2	P_2O_5	CuO	Cu_2O	SO_3	MnO	Cl	BaO	SrO	Total
1.	Turganik	P25-3sh-1	19196n	49.41	30.27	2.26	14.68	1.05	0.33	0.98	0.31	1.03	–	–	–	–	–	–	–	100.31
2.			19196o	45.18	44.98	2.06	1.50	3.50	0.29	1.30	–	0.70	0.24	–	–	–	–	–	–	99.73
3.			19196s	48.69	31.43	2.07	11.44	2.68	0.21	1.09	0.13	1.17	0.58	–	–	–	–	–	–	99.48
4.			19196v	48.72	27.51	2.48	14.24	2.00	0.27	0.92	0.26	0.93	2.06	–	–	–	–	–	–	99.40
			Average	48.00	33.55	2.22	10.47	2.31	0.28	1.07	0.18	0.96	0.72	–	–	–	–	–	–	99.73
5.		P25-6sh	19198f	49.56	19.96	6.12	16.98	0.38	1.40	–	0.44	2.17	–	–	–	–	–	0.28	–	99.79
6.			19198h	45.26	24.97	5.33	18.86	–	1.40	–	0.39	1.98	–	–	–	–	–	0.16	–	99.81
7.			19198r	50.15	20.72	6.60	15.76	0.21	1.72	3.11	0.49	1.80	–	–	–	–	–	–	–	100.58
			Average	47.41	22.47	5.73	17.92	0.19	1.4	–	0.42	2.08	–	–	–	–	–	0.15	–	99.80
8.	Kamenny Ambar, Sintashta culture layer	3110/718	19237a	44.43	26.36	11.15	14.24	–	0.84	2.11	0.13	0.64	–	–	–	–	–	–	–	99.89
9.			19237b	43.9	27.88	10.96	14.09	–	0.78	1.94	0.25	0.62	–	–	–	–	–	–	–	100.42
10.			19237c	45.77	27.63	10.22	13.72	–	0.73	1.9	–	0.6	–	–	–	–	–	–	–	100.57
			Average	44.70	27.29	10.78	14.02	–	0.78	1.98	0.13	0.62	–	–	–	–	–	–	–	100.29
11.		3260d/718	19238a	50.32	35.69	6.86	5.44	–	0.45	1.08	–	0.63	0.36	–	–	–	–	–	–	100.84
12.			19238b	51.71	32.85	6.99	4.35	–	0.52	1.2	0.32	0.69	0.43	–	–	–	–	–	–	99.07
13.			19238c	50.42	33.52	7.46	5.95	–	0.43	1.02	0.23	0.62	0.27	–	–	–	–	–	–	99.93
			Average	50.82	34.02	7.10	5.25	–	0.47	1.10	0.18	0.65	0.35	–	–	–	–	–	–	99.95
14.	Kamenny Ambar, Alakul culture layer	342-2	12223r	34.29	43.04	6.92	5.32	0.35	1.14	3.15	–	5.00	–	–	–	0.28	–	–	–	99.49
15.			12223s	35.18	34.93	8.27	11.25	0.27	1.55	2.88	–	5.57	–	–	–	0.34	–	–	–	100.24
16.			12223l	34.48	33.67	8.29	10.73	–	1.77	2.95	–	5.65	1.38	–	0.89	0.24	–	0.32	–	100.37
17.			12223m	33.27	35.68	8.08	10.15	–	1.43	4.97	–	5.88	–	–	–	0.25	–	0.45	–	100.16
18.			12223b	35.71	33.45	8.12	11.28	–	1.48	3.07	–	6.04	–	–	–	0.24	–	0.33	–	99.72
			Average	34.59	36.15	7.94	9.75	0.12	1.47	3.40	–	5.63	0.28	–	0.18	0.27	–	0.22	–	100.00
19.	Ustye	161y-1677	15225f	47.84	24.71	15.42	5.81	0.83	0.25	1.83	0.82	1.85	–	–		–	–	–	–	99.36
20.			15225l	51.93	19.05	16.30	5.75	0.64	0.74	3.41	0.74	0.42	0.55	–	0.20	–	–	–	–	99.73
21.			15225t	51.32	22.41	12.85	9.49	1.00	0.54	2.03	0.65	0.67	–	–		–	–	–	–	100.96
			Average	50.36	22.06	14.86	7.02	0.82	0.51	2.42	0.74	0.98	0.18	–	0.07	–	–	–	–	100.02
22.		161y-9187	16106e*	50.84	21.02	14.03	5.62	0.82	0.34	4.84	0.25	1.23	–	–	–	–	–	–	–	99.86
23.		161y-10472	15224g	58.98	10.15	20.17	1.16	0.83	0.25	8.17	0.53	–	–	–	–	–	–	–	–	100.24
24.			15224i	56.94	14.68	17.09	1.28	1.08	0.39	7.69	1.08	–	–	–	–	0.21	–	–	–	100.23
			Average	55.59	15.28	17.10	2.69	0.91	0.33	6.90	0.62	0.41	–	–	–	0.07	–	–	–	100.11
25.		161y-10656	16107f	49.31	18.74	16.12	7.14	0.23	0.41	5.15	0.26	1.81	0.42	–	–	–	–	–	–	99.80
26.			16107i	43.26	21.45	18.83	10.46	–	–	2.74	0.71	2.32	–	–	–	0.18	–	–	–	100.00
27.			16107o	51.75	26.23	5.42	7.41	5.38	–	1.91	0.15	1.21	–	–	–	0.74	–	–	–	100.20
			Average	48.11	22.14	13.46	8.34	1.87	0.14	3.27	0.37	1.78	0.14	–	–	0.31	–	–	–	100.00
28.		161y-10864	16105g	42.84	23.99	11.72	15.55	–	1.01	2.56	0.24	1.74	–	–	–	0.27	–	–	–	99.92
29.			16105u	42.78	25.46	8.59	14.58	0.58	1.26	4.33	0.17	1.45	0.57	–	–	0.46	–	–	–	100.23

			Average	42.81	24.73	10.16	15.07	0.29	1.14	3.45	0.21	1.60	0.29	–	–	0.37	–	–	–	100.08
30.	Sarym-Sakly	w641-10-23	16125d	51.16	18.94	14.55	9.75	0.42	0.89	1.65	0.59	0.47	–	0.43	–	–	–	–	–	98.86
31.			16125j	50.54	19.90	13.59	10.45	0.42	0.88	1.30	0.65	0.33	–	0.34	–	–	–	–	–	98.40
32.			16125n	48.27	20.38	12.23	12.36	0.36	0.56	0.76	0.65	–	–	0.53	–	–	–	–	–	96.10
			Average	49.99	19.74	13.46	10.85	0.40	0.78	1.24	0.63	0.27	–	0.43	–	–	–	–	–	97.79
33.		w641-30-55	16127g	45.92	20.51	14.14	13.22	–	1.56	2.24	0.69	0.59	–	–	0.90	–	–	–	–	99.76
34.			16127l	44.19	23.12	13.89	12.47	–	1.33	2.16	0.96	0.79	–	–	0.59	–	–	–	–	99.50
35.			16127q	43.78	22.19	13.79	14.02	–	1.09	1.87	1.16	0.67	–	–	0.74	–	–	–	–	99.31
			Average	44.63	21.94	13.94	13.24	–	1.33	2.09	0.94	0.68	–	–	0.74	–	–	–	–	99.52
36.		w641-30-85	16129e**	50.84	23.36	7.16	13.42	1.97	0.37	0.98	0.46	0.54	–	–	0.56	–	–	–	–	100.00
37.			16129k***	49.56	28.59	7.86	9.02	1.31	0.60	1.48	0.38	0.50	–	–	0.44	–	–	–	–	100.00
38.			16129o	53.59	22.3	7.73	11.70	1.79	0.34	1.18	0.4	0.36	–	–	0.61	–	–	–	–	100.00
39.			16129t	51.01	24.73	8.71	10.84	1.05	0.75	1.43	0.49	0.40	–	–	0.60	–	–	–	–	100.00
			Average	51.25	24.75	7.87	11.25	1.53	0.52	1.27	0.43	0.45	–	–	0.55	–	–	–	–	100.00
40.	Levoberezhnoe (Sintashta II)	Sin II 264	17179f****	40.85	31.84	12.4	10.44	–	0.47	2.03	0.67	0.86	0.15	–	–	–	–	–	–	100.00
41.			17179g	41.59	30.11	13.39	10.79	–	0.28	2.09	0.83	0.94	–	–	–	–	–	–	–	100.00
42.			17179j	41.53	29.06	13.35	11.00	–	0.38	2.16	0.75	0.87	–	–	–	–	–	–	–	99.11
43.			17179m	40.05	26.45	16.29	11.51	–	0.59	2.5	0.79	1.11	0.27	–	0.29	–	–	–	–	99.84
			Average	41.01	29.37	13.86	10.94	–	0.43	2.20	0.76	0.95	0.11	–	0.07	–	–	–	–	99.74
44.		Sin II 529	17178d	49.46	19.54	18.49	5.20	0.61	0.37	3.59	0.48	0.44	0.49	–	0.37	–	–	–	–	99.05
45.			17178j	47.76	21.80	17.90	6.45	0.51	0.48	3.00	0.60	0.58	–	–	0.44	–	–	–	–	99.53
46.			17178p	48.20	22.09	16.49	6.93	0.50	0.5	3.17	0.53	0.57	–	–	0.55	–	–	–	–	99.53
			Average	48.47	21.14	17.63	6.19	0.54	0.45	3.25	0.54	0.53	0.16	–	0.45	–	–	–	–	99.37
47.		Sin II 709	17177c	43.39	26.56	13.64	11.91	0.19	0.35	1.81	0.83	0.91	1.13	–	0.22	–	–	–	–	100.95
48.			17177n	42.6	24.37	14.79	12.09	–	0.52	2.3	0.72	1.14	–	–	0.34	–	–	0.31	–	99.17
49.			17177t	43.3	23.46	15.23	12.31	–	0.44	2.37	0.79	0.93	–	–	0.41		–	–	–	99.24
			Average	43.10	24.80	14.55	12.10	0.06	0.44	2.16	0.78	0.99	0.38	–	0.32	–	–	0.10	–	99.79
50.	Katsbakh 1	w937-20-1s	16124c	49.43	25.76	2.07	17.59	2.07	0.26	0.59	–	0.37	–	–	–	1.37	–	–	–	99.50
51.	Vorovskaya Yama	VYa100-3	2035d	55.64	3.25	20.34	0.42	0.46	–	19.49	–	–	–	–	–	–	–	–	–	100.16
52.			16115i	54.51	3.14	21.66	1.79	–	1.32	16.49	0.20	–	–	–	–	0.29		–	–	99.16
			Average	55.08	3.20	21.00	1.11	0.23	0.66	17.99	0.10	–	–	–	–	0.15	–	–	–	99.66
53.	Rodnikovoe	P-87-1sh	19199c	39.46	35.08	3.59	8.63	0.81	1.20	1.83	–	0.53	–	–	–	–	–	8.09	–	99.25
54.			19199d	39.11	33.99	3.30	6.21	0.69	1.21	2.28	–	0.38	–	–	–	–	–	12.46	0.59	100.22
55.			19199f	40.43	28.47	5.29	2.84	0.21	1.44	3.43	–	0.68	–	–	–	–	0.16	15.69	0.77	99.42
56.			19199n	39.75	30.96	4.05	4.66	0.25	1.35	2.69	–	0.54	–	–	–	–	–	14.36	0.86	99.47
			Average	39.69	32.13	4.06	5.59	0.49	1.30	2.56	–	0.53	–	–	–	–	0.04	12.65	0.56	99.59
57.	Ivanovskoe	P-89sh-1	19195c	52.84	20.68	6.39	7.06	1.19	1.29	1.33	0.46	–	0.94	–	–	–	0.39	6.65	–	99.22
58.			19195g	57.42	4.27	11.06	13.28	2.45	3.39	4.68	0.64	0.58	2.60	–	–	–	–	0.61	–	100.96
59.			19195i	52.39	10.30	6.68	17.35	2.11	1.76	2.23	0.90	0.25	1.87	–	–	–	0.15	3.60	–	99.59

			Average	54.22	11.75	8.04	12.56	1.92	2.15	2.75	0.67	0.28	1.80	–	–	–	0.18	3.62	–	99.92
60.		P-89-6sh	19197b	48.87	6.39	6.86	15.04	1.21	1.29	2.17	0.90	–	12.18	–	0.27	–	0.12	5.64	–	100.94
61.			19197d	53.67	7.30	9.36	10.81	1.86	2.06	2.91	0.33	–	8.38	–	0.39	–	–	2.93	–	100.00
62.			19197g	51.14	9.37	10.07	11.24	2.03	2.22	3.24	0.49	–	6.80	–	0.24	–	–	2.93	–	99.77
63.			19197l	55.04	7.12	10.04	5.57	1.32	2.47	3.27	–	–	10.65	–	–	–	–	4.51	–	100.00
			Average	52.18	7.55	9.08	10.67	1.61	2.01	2.90	0.43	–	9.50	–	0.23	–	0.03	4.00	–	100.18
64.	Ordynsky Ovrag	P-22-1sh	19129f	55.88	12.56	6.61	4.96	1.57	1.47	1.33	0.49	–	0.84	–	–	–	1.02	13.27	–	100.00
65.			19129j	60.49	4.46	8.96	19.10	1.13	1.29	0.81	–	0.20	–	–	–	–	0.95	2.61	–	100.00
66.			19129u	55.69	10.49	9.76	5.18	1.89	1.98	1.62	0.69	–	–	1.21	–	–	0.69	10.79	–	100.00
			Average	57.35	9.17	8.44	9.75	1.53	1.58	1.25	0.39	0.07	0.28	0.40	–	–	0.89	8.89	–	100.00
67.		P-22-2sh	19128c	56.74	2.81	13.13	5.63	2.82	3.05	1.56	1.71	0.89	0.81	–	–	–	0.19	10.46	–	99.80
68.			19128l	51.35	11.05	6.34	10.81	2.45	1.04	0.95	0.36	1.14	–	–	0.35	–	0.23	14.21	–	100.28
69.			19128q	54.25	17.95	7.42	6.32	1.73	2.22	1.58	0.42	0.42	1.17	–	–	–	0.27	6.46	–	100.21
			Average	54.11	10.60	8.96	7.59	2.33	2.10	1.36	0.83	0.82	0.66	–	0.12	–	0.23	10.38	–	100.10
70.	Kzyloba	P-81sh	19200c	52.37	17.31	12.79	7.59	3.16	2.03	3.17	0.70	0.72	–	–	–	0.27	–	–	–	100.11
71.			19200f	51.77	18.22	14.08	7.79	1.78	2.17	3.18	0.73	0.84	–	–	–	0.25	–	–	–	100.80
72.			19200p	50.68	18.11	14.24	8.07	1.89	1.97	3.41	0.66	0.87	–	–	–	0.32	–	–	–	100.21
			Average	51.61	17.88	13.70	7.82	2.28	2.06	3.25	0.70	0.81	–	–	–	0.28	–	–	–	100.37

Note. Analyses were carried out using VEGA3 TESCAN SEM electron microscope (operator I.A. Blinov) in Institute of Mineralogy SU FRC MG UB RAS, dash – element is not detected. Composition also contains: *– 0.87 wt. % Cr_2O_3, ** – 0.34 wt. % Cr_2O_3, *** – 0.27 wt. % Cr_2O_3, ****– 0.27 wt. % As_2O_3.