

Supplement Table S1: Detailed sample information including tephra names, coordinates, and references

	Sample No.	Tephra name	Latitude	Longitude	Sample name in Ref.	Ref.
Holocene	1	To-a (Kemanai pyroclastic flow deposits)	40°23'22.4"N	140°58'00.7"E	TWD-1	Ishimura et al. (2014)
	2	To-a (Oyu3 pumice)	40°23'22.4"N	140°58'00.7"E	TWD-2	Ishimura et al. (2014)
	3	To-a (Oyu2 ash)	40°23'22.4"N	140°58'00.7"E	TWD-3	Ishimura et al. (2014)
	4	To-a (Oyu1 pumice)	40°23'22.4"N	140°58'00.7"E	TWD-4	Ishimura et al. (2014)
	5	To-a	38°41'56.60"N	141°33'49.36"E		
	6	To-b (Mayogatai pumice)	40°24'50.0"N	140°57'40.2"E	Kudo-3	Ishimura et al. (2014)
	7	To-b (Mayogatai pumice)	40°24'50.0"N	140°57'40.2"E	Kudo-4	Ishimura et al. (2014)
	8	To-Cu (Utarube ash)	40°23'18.66"N	140°58'20.78"E	TSR-12	Ishimura and Hiramane (2020)
	9	To-Cu (Utarube ash)	40°23'18.66"N	140°58'20.78"E	TSR-11	Ishimura and Hiramane (2020)
	10	To-Cu (Utarube ash)	40°23'18.66"N	140°58'20.78"E	TSR-10	Ishimura and Hiramane (2020)
	11	To-Cu (Utarube ash)	40°23'18.66"N	140°58'20.78"E	TSR-9-1	Ishimura and Hiramane (2020)
	12	To-Cu (Utarube ash)	40°23'18.66"N	140°58'20.78"E	TSR-8	Ishimura and Hiramane (2020)
	13	To-Cu (Utarube ash)	40°23'18.66"N	140°58'20.78"E	TSR-7	Ishimura and Hiramane (2020)
	14	To-Cu (Utarube ash)	40°23'18.66"N	140°58'20.78"E	TSR-9-2	Ishimura and Hiramane (2020)
	15	To-Cu (Utarube ash)	40°23'18.66"N	140°58'20.78"E	TSR-6-1	Ishimura and Hiramane (2020)
	16	To-Cu (Utarube ash)	40°23'18.66"N	140°58'20.78"E	TSR-6-2	Ishimura and Hiramane (2020)
	17	To-Cu (Kaneegasawa pumice)	40°23'18.66"N	140°58'20.78"E	TSR-5	Ishimura and Hiramane (2020)
	18	To-Cu (Kaneegasawa pumice)	40°23'18.66"N	140°58'20.78"E	TSR-4	Ishimura and Hiramane (2020)
	19	To-Cu (Chuseri pumice)	40°23'18.66"N	140°58'20.78"E	TSR-3	Ishimura and Hiramane (2020)
	20	To-Cu (Chuseri pumice)	40°23'18.66"N	140°58'20.78"E	TSR-2	Ishimura and Hiramane (2020)
	21	To-Cu (Chuseri pumice)	40°23'18.66"N	140°58'20.78"E	TSR-1	Ishimura and Hiramane (2020)
	22	Herai ash	40°28'27.5"N	140°58'22.9"E	Kudo-6	Ishimura et al. (2014)
	23	Oguni pumice	40°25'08.5"N	140°56'51.9"E	Kudo-7	Ishimura et al. (2014)
	24	Oguni pumice	40°11'31.1"N	141°47'11.4"E	OSN-Br-16.94	Ishimura et al. (2014)
	25	Oguni pumice	39°25'46.7"N	142°00'36.2"E	KYD-Br3-8.60	Ishimura et al. (2014)
	26	To-Nb	40°27'07.6"N	140°54'45.3"E	Kudo-8	Ishimura et al. (2014)
	27	To-Nb	40°27'13.1"N	140°54'43.2"E	Kudo-9	Ishimura et al. (2014)
	28	To-Nb	40°24'11.3"N	140°54'55.6"E	Kudo-10	Ishimura et al. (2014)
	29	To-Nb	40°11'31.1"N	141°47'11.4"E	OSN-Br-25.65	Ishimura et al. (2014)
	30	To-Nb	40°11'31.1"N	141°47'11.4"E	OSN-Br-26.96	Ishimura et al. (2014)
	31	To-Nb	40°16'30.41"N	141°42'4.03"E		
Pleistocene	32	To-H	40°34'27.79"N	141°24'5.31"E	18 in Loc. 3	Miyazaki and Ishimura (2018)
	33	To-HP	40°34'27.79"N	141°24'5.31"E	19 in Loc. 3	Miyazaki and Ishimura (2018)
	34	To-HP	40°34'27.79"N	141°24'5.31"E	20 in Loc. 3	Miyazaki and Ishimura (2018)
	35	To-HP	40°34'27.79"N	141°24'5.31"E	21 in Loc. 3	Miyazaki and Ishimura (2018)
	36	To-HP	40°34'27.79"N	141°24'5.31"E	22 in Loc. 3	Miyazaki and Ishimura (2018)
	37	To-HP	40°34'27.79"N	141°24'5.31"E	23 in Loc. 3	Miyazaki and Ishimura (2018)
	38	To-HP	40°34'27.79"N	141°24'5.31"E	24 in Loc. 3	Miyazaki and Ishimura (2018)
	39	To-HP	40°34'27.79"N	141°24'5.31"E	25 in Loc. 3	Miyazaki and Ishimura (2018)
	40	To-BP2	40°34'57"N	141°26'12"E	11 in Loc. 2	Miyazaki and Ishimura (2018)
	41	To-BP2	40°34'57"N	141°26'12"E	12 in Loc. 2	Miyazaki and Ishimura (2018)
	42	To-BP2	40°34'57"N	141°26'12"E	13 in Loc. 2	Miyazaki and Ishimura (2018)
	43	To-Of	40°26'35.59"N	141°39'19.22"E	47 in Loc. 8	Miyazaki and Ishimura (2018)
	44	To-G	40°32'33.83"N	141°27'12.97"E	28 in Loc. 4	Miyazaki and Ishimura (2018)
	45	To-G	40°32'33.83"N	141°27'12.97"E	29 in Loc. 4	Miyazaki and Ishimura (2018)
	46	To-G	40°32'33.83"N	141°27'12.97"E	30 in Loc. 4	Miyazaki and Ishimura (2018)
	47	To-G	40°30'59.56"N	141°35'40.71"E	38 in Loc. 5	Miyazaki and Ishimura (2018)
	48	To-Kb	40°32'33.83"N	141°27'12.97"E	31 in Loc. 4	Miyazaki and Ishimura (2018)
	49	To-Ok ₂	40°26'35.59"N	141°39'19.22"E	48 in Loc. 8	Miyazaki and Ishimura (2018)
	50	To-AP	40°26'35.59"N	141°39'19.22"E	49 in Loc. 8	Miyazaki and Ishimura (2018)
	51	To-CP	40°26'35.59"N	141°39'19.22"E	50 in Loc. 8	Miyazaki and Ishimura (2018)
	52	NP	40°26'35.59"N	141°39'19.22"E	53 in Loc. 8	Miyazaki and Ishimura (2018)

Supplement Table S2: Individual data, mean values, and standard deviations for the major element composition

Sample No. 1	SiO ₂	TiO ₂	Al ₂ O ₃	FeO*	MnO	MgO	CaO	K ₂ O	Na ₂ O	Total**	Comment
1	75.6	0.5	13.4	2.0	0.2	0.6	2.4	1.4	4.1	98.1	To-a (Kemanai pyroclastic flow deposits)
2	77.2	0.2	13.0	1.8	0.0	0.5	2.0	1.3	4.1	96.9	To-a (Kemanai pyroclastic flow deposits)
3	76.3	0.5	12.9	2.0	0.3	0.5	2.1	1.4	4.1	98.4	To-a (Kemanai pyroclastic flow deposits)
4	76.4	0.6	12.8	1.9	0.2	0.6	2.1	1.4	4.1	98.7	To-a (Kemanai pyroclastic flow deposits)
5	76.4	0.4	13.0	2.0	0.2	0.5	2.0	1.3	4.2	98.3	To-a (Kemanai pyroclastic flow deposits)
6	77.2	0.4	12.7	1.9	0.1	0.5	1.9	1.2	4.0	97.2	To-a (Kemanai pyroclastic flow deposits)
7	77.1	0.3	13.1	1.6	0.1	0.5	2.1	1.2	4.1	98.8	To-a (Kemanai pyroclastic flow deposits)
8	77.0	0.3	13.0	1.9	0.1	0.6	1.9	1.2	4.1	96.9	To-a (Kemanai pyroclastic flow deposits)
9	76.8	0.5	12.9	1.8	0.1	0.5	2.1	1.4	4.1	97.8	To-a (Kemanai pyroclastic flow deposits)
10	76.5	0.4	13.0	1.8	0.2	0.5	2.1	1.4	4.2	98.4	To-a (Kemanai pyroclastic flow deposits)
11	76.4	0.4	13.0	1.9	0.2	0.6	2.0	1.4	4.1	99.3	To-a (Kemanai pyroclastic flow deposits)
12	76.2	0.3	13.4	2.0	0.1	0.6	2.2	1.3	4.0	97.7	To-a (Kemanai pyroclastic flow deposits)
13	77.0	0.3	12.8	1.9	0.1	0.5	2.0	1.2	4.1	97.9	To-a (Kemanai pyroclastic flow deposits)
14	76.6	0.4	12.8	1.9	0.2	0.5	2.0	1.4	4.1	98.0	To-a (Kemanai pyroclastic flow deposits)
15	77.0	0.3	13.0	1.8	0.0	0.6	1.9	1.3	4.1	96.7	To-a (Kemanai pyroclastic flow deposits)
16	76.9	0.5	12.9	1.9	0.1	0.4	2.0	1.3	4.0	97.4	To-a (Kemanai pyroclastic flow deposits)
Ave.	76.7	0.4	13.0	1.9	0.1	0.5	2.0	1.3	4.1	97.9	
SD	0.4	0.1	0.2	0.1	0.1	0.0	0.1	0.1	0.0	0.8	
Sample No.2	SiO ₂	TiO ₂	Al ₂ O ₃	FeO*	MnO	MgO	CaO	K ₂ O	Na ₂ O	Total**	Comment
1	76.3	0.3	13.1	1.9	0.2	0.6	2.1	1.3	4.2	97.3	To-a (Oyu3 pumice)
2	76.5	0.4	13.0	2.0	0.1	0.5	2.0	1.3	4.2	97.7	To-a (Oyu3 pumice)
3	76.5	0.5	13.0	1.9	0.2	0.5	2.1	1.4	4.0	98.8	To-a (Oyu3 pumice)
4	76.6	0.3	13.2	1.9	0.1	0.5	2.0	1.3	4.1	98.7	To-a (Oyu3 pumice)
5	76.5	0.4	13.0	2.1	0.1	0.6	1.9	1.3	4.2	98.9	To-a (Oyu3 pumice)
6	76.6	0.5	12.7	2.0	0.2	0.5	2.0	1.4	4.2	98.3	To-a (Oyu3 pumice)
7	76.3	0.5	12.9	2.0	0.2	0.5	2.1	1.4	4.1	98.1	To-a (Oyu3 pumice)
8	77.3	0.3	13.0	1.7	0.0	0.5	1.9	1.2	4.1	97.2	To-a (Oyu3 pumice)
9	77.1	0.3	12.9	1.8	0.1	0.5	1.9	1.2	4.0	98.6	To-a (Oyu3 pumice)
10	76.5	0.4	12.9	1.9	0.2	0.5	2.2	1.4	4.1	98.1	To-a (Oyu3 pumice)
11	77.1	0.3	13.0	2.0	0.0	0.5	2.0	1.3	3.9	96.8	To-a (Oyu3 pumice)
12	76.6	0.4	12.8	2.0	0.2	0.6	2.1	1.3	4.0	96.6	To-a (Oyu3 pumice)
13	77.6	0.2	13.1	1.7	0.0	0.4	1.8	1.2	4.1	97.8	To-a (Oyu3 pumice)
14	76.7	0.5	12.8	1.9	0.2	0.5	2.1	1.4	4.0	97.8	To-a (Oyu3 pumice)
15	77.2	0.2	13.0	1.7	0.1	0.5	2.0	1.3	4.1	98.0	To-a (Oyu3 pumice)
16	76.3	0.6	12.9	2.0	0.2	0.5	2.1	1.4	4.0	98.6	To-a (Oyu3 pumice)
Ave.	76.7	0.4	13.0	1.9	0.1	0.5	2.0	1.3	4.1	97.9	
SD	0.4	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.7	
Sample No. 3	SiO ₂	TiO ₂	Al ₂ O ₃	FeO*	MnO	MgO	CaO	K ₂ O	Na ₂ O	Total**	Comment
1	76.6	0.4	13.0	2.0	0.1	0.5	2.1	1.4	4.1	98.3	To-a (Oyu2 ash)
2	77.2	0.2	13.1	1.8	0.1	0.5	1.9	1.3	4.0	97.2	To-a (Oyu2 ash)
3	76.7	0.3	12.8	1.9	0.1	0.5	2.1	1.3	4.2	98.5	To-a (Oyu2 ash)
4	76.8	0.4	12.9	1.8	0.0	0.6	2.2	1.3	4.1	97.5	To-a (Oyu2 ash)
5	76.4	0.5	12.9	2.0	0.2	0.5	2.2	1.3	4.1	98.6	To-a (Oyu2 ash)
6	76.5	0.4	13.1	1.8	0.2	0.5	2.1	1.3	4.1	99.0	To-a (Oyu2 ash)
7	76.9	0.4	12.9	1.9	0.1	0.5	2.0	1.4	4.1	97.9	To-a (Oyu2 ash)
8	76.6	0.5	13.1	1.8	0.1	0.5	2.0	1.4	4.0	97.3	To-a (Oyu2 ash)
9	77.0	0.4	12.9	1.8	0.2	0.5	1.9	1.4	4.0	98.0	To-a (Oyu2 ash)
10	76.4	0.4	12.9	2.0	0.1	0.5	2.1	1.3	4.1	98.9	To-a (Oyu2 ash)
11	77.0	0.3	12.9	1.9	0.1	0.5	2.0	1.3	4.1	97.9	To-a (Oyu2 ash)
12	77.2	0.3	12.9	1.8	0.0	0.5	2.0	1.3	4.0	96.8	To-a (Oyu2 ash)
13	76.8	0.4	12.9	1.9	0.1	0.5	2.0	1.3	4.1	97.0	To-a (Oyu2 ash)
14	76.9	0.3	13.0	1.8	0.1	0.6	1.9	1.3	4.1	96.6	To-a (Oyu2 ash)
15	76.3	0.5	12.9	1.8	0.3	0.5	2.0	1.3	4.4	96.0	To-a (Oyu2 ash)
16	76.6	0.4	13.0	1.9	0.2	0.5	2.1	1.2	4.1	97.4	To-a (Oyu2 ash)
Ave.	76.7	0.4	12.9	1.9	0.1	0.5	2.0	1.3	4.1	97.7	
SD	0.3	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.1	0.9	
Sample No. 4	SiO ₂	TiO ₂	Al ₂ O ₃	FeO*	MnO	MgO	CaO	K ₂ O	Na ₂ O	Total**	Comment
1	76.8	0.4	13.0	1.8	0.1	0.5	2.1	1.3	4.1	98.9	To-a (Oyu1 pumice)
2	76.8	0.4	13.0	1.8	0.2	0.5	2.0	1.3	4.2	97.9	To-a (Oyu1 pumice)
3	76.4	0.4	13.0	1.9	0.2	0.6	2.1	1.3	4.1	98.4	To-a (Oyu1 pumice)
4	76.7	0.3	13.0	1.9	0.1	0.5	2.1	1.3	4.2	97.7	To-a (Oyu1 pumice)
5	76.8	0.4	12.8	1.9	0.1	0.6	2.1	1.3	4.0	95.4	To-a (Oyu1 pumice)
6	76.5	0.4	12.9	1.9	0.2	0.5	2.1	1.4	4.1	98.9	To-a (Oyu1 pumice)
7	76.7	0.4	12.9	1.8	0.2	0.5	2.0	1.3	4.2	95.9	To-a (Oyu1 pumice)
8	76.8	0.3	13.0	1.9	0.0	0.5	2.2	1.3	4.0	97.4	To-a (Oyu1 pumice)

9	76.8	0.3	12.9	1.9	0.1	0.6	2.0	1.2	4.2	98.4	To-a (Oyu1 pumice)
10	76.6	0.4	12.8	2.0	0.1	0.6	2.0	1.4	4.2	98.1	To-a (Oyu1 pumice)
11	76.8	0.4	12.9	2.0	0.1	0.5	2.0	1.3	4.2	97.9	To-a (Oyu1 pumice)
12	76.3	0.4	13.0	2.0	0.2	0.6	2.1	1.4	4.2	98.7	To-a (Oyu1 pumice)
13	76.9	0.3	13.1	1.8	0.1	0.6	2.0	1.3	4.1	97.4	To-a (Oyu1 pumice)
14	76.7	0.4	12.9	1.9	0.1	0.5	2.1	1.4	4.1	98.1	To-a (Oyu1 pumice)
15	77.2	0.3	13.0	1.7	0.0	0.5	2.0	1.2	4.1	95.7	To-a (Oyu1 pumice)
16	76.3	0.5	13.0	2.0	0.2	0.5	2.1	1.3	4.1	98.1	To-a (Oyu1 pumice)
Ave.	76.7	0.4	12.9	1.9	0.1	0.5	2.1	1.3	4.1	97.7	
SD	0.2	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	1.1	

Sample No. 5	SiO ₂	TiO ₂	Al ₂ O ₃	FeO*	MnO	MgO	CaO	K ₂ O	Na ₂ O	Total**	Comment
1	76.6	0.4	13.0	1.8	0.1	0.5	2.1	1.4	4.1	98.1	To-a
2	76.8	0.4	12.9	1.8	0.1	0.5	2.1	1.4	4.1	97.1	To-a
3	76.8	0.4	13.0	1.8	0.1	0.5	2.1	1.3	4.1	97.3	To-a
4	76.5	0.4	12.9	2.0	0.1	0.5	2.1	1.4	4.2	97.7	To-a
5	76.4	0.5	13.0	1.9	0.2	0.6	2.1	1.4	4.0	98.5	To-a
6	76.3	0.5	13.0	1.9	0.1	0.5	2.1	1.3	4.3	98.1	To-a
7	77.4	0.2	13.1	1.7	0.0	0.5	1.9	1.2	4.2	97.4	To-a
8	76.6	0.4	13.1	1.8	0.1	0.5	2.0	1.3	4.2	97.3	To-a
9	76.6	0.4	13.1	1.7	0.1	0.5	2.0	1.4	4.1	98.3	To-a
10	76.8	0.3	12.9	1.7	0.0	0.6	2.1	1.4	4.2	97.2	To-a
11	77.0	0.3	13.0	1.8	0.0	0.6	2.0	1.2	4.2	97.3	To-a
12	76.9	0.2	13.1	1.9	0.0	0.5	1.9	1.2	4.2	96.9	To-a
13	76.7	0.5	12.9	1.9	0.2	0.5	2.0	1.4	3.9	97.1	To-a
14	76.5	0.4	13.0	1.8	0.3	0.6	2.1	1.3	4.1	98.5	To-a
15	76.9	0.2	13.1	1.9	0.0	0.5	2.0	1.3	4.1	97.0	To-a
16	77.0	0.3	13.1	1.9	0.0	0.6	2.0	1.2	4.1	96.5	To-a
17	76.7	0.4	12.9	1.8	0.2	0.5	2.0	1.3	4.3	98.0	To-a
18	76.2	0.5	13.0	2.0	0.2	0.5	2.2	1.4	4.1	98.1	To-a
Ave.	76.7	0.4	13.0	1.8	0.1	0.5	2.0	1.3	4.1	97.6	
SD	0.3	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.6	

Sample No. 6	SiO ₂	TiO ₂	Al ₂ O ₃	FeO*	MnO	MgO	CaO	K ₂ O	Na ₂ O	Total**	Comment
1	76.9	0.3	13.5	1.6	0.1	0.4	1.9	1.3	4.1	97.6	To-b (Mayogatai pumice)
2	76.7	0.3	13.3	1.6	0.1	0.4	1.9	1.3	4.4	98.3	To-b (Mayogatai pumice)
3	76.6	0.2	13.3	1.6	0.1	0.6	2.1	1.3	4.2	98.2	To-b (Mayogatai pumice)
4	76.9	0.3	13.3	1.6	0.0	0.5	1.9	1.2	4.3	93.4	To-b (Mayogatai pumice)
5	76.6	0.3	13.1	1.7	0.2	0.5	2.1	1.3	4.2	97.5	To-b (Mayogatai pumice)
6	76.8	0.3	13.3	1.7	0.0	0.6	1.9	1.3	4.2	97.3	To-b (Mayogatai pumice)
7	76.6	0.3	13.3	1.7	0.2	0.5	1.9	1.3	4.1	99.0	To-b (Mayogatai pumice)
8	76.9	0.4	13.1	1.7	0.2	0.4	1.8	1.5	4.0	98.3	To-b (Mayogatai pumice)
9	77.2	0.2	13.2	1.6	0.0	0.5	2.0	1.3	4.0	97.0	To-b (Mayogatai pumice)
10	76.8	0.4	12.9	1.9	0.3	0.5	1.9	1.4	4.1	98.6	To-b (Mayogatai pumice)
11	77.5	0.2	13.1	1.7	0.0	0.5	1.8	1.3	4.0	97.9	To-b (Mayogatai pumice)
12	76.3	0.4	13.2	1.8	0.1	0.6	2.1	1.3	4.1	98.5	To-b (Mayogatai pumice)
13	77.1	0.4	12.9	1.8	0.1	0.4	1.7	1.5	4.0	98.5	To-b (Mayogatai pumice)
14	76.6	0.3	13.4	1.7	0.1	0.5	1.9	1.2	4.2	97.9	To-b (Mayogatai pumice)
15	76.2	0.5	13.3	1.7	0.2	0.6	2.1	1.3	4.2	98.2	To-b (Mayogatai pumice)
16	76.7	0.3	13.3	1.6	0.0	0.5	2.1	1.3	4.2	97.9	To-b (Mayogatai pumice)
17	76.2	0.3	13.7	1.4	0.1	0.3	2.2	1.3	4.6	97.6	To-b (Mayogatai pumice)
18	76.5	0.3	13.4	1.8	0.1	0.5	1.9	1.3	4.3	98.7	To-b (Mayogatai pumice)
Ave.	76.7	0.3	13.3	1.7	0.1	0.5	2.0	1.3	4.2	97.8	
SD	0.3	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	1.2	

Sample No. 7	SiO ₂	TiO ₂	Al ₂ O ₃	FeO*	MnO	MgO	CaO	K ₂ O	Na ₂ O	Total**	Comment
1	77.1	0.3	13.2	1.6	0.0	0.5	1.9	1.3	4.2	97.7	To-b (Mayogatai pumice)
2	77.2	0.3	13.1	1.5	0.1	0.5	2.0	1.3	4.2	98.5	To-b (Mayogatai pumice)
3	76.9	0.4	13.0	1.6	0.1	0.5	1.9	1.4	4.2	98.1	To-b (Mayogatai pumice)
4	76.8	0.4	13.1	1.6	0.1	0.4	2.1	1.4	4.1	98.7	To-b (Mayogatai pumice)
5	77.1	0.3	13.1	1.5	0.1	0.5	1.9	1.3	4.2	98.9	To-b (Mayogatai pumice)
6	76.5	0.4	13.2	1.7	0.2	0.5	2.0	1.4	4.2	98.9	To-b (Mayogatai pumice)
7	76.9	0.3	13.3	1.5	0.0	0.4	2.0	1.3	4.4	98.2	To-b (Mayogatai pumice)
8	77.2	0.3	13.0	1.6	0.1	0.5	1.9	1.2	4.3	98.9	To-b (Mayogatai pumice)
9	76.5	0.4	13.1	1.8	0.2	0.5	1.8	1.3	4.4	98.6	To-b (Mayogatai pumice)
10	78.0	0.2	12.9	1.3	0.1	0.3	0.9	1.9	4.4	96.8	To-b (Mayogatai pumice)
11	78.4	0.2	13.3	1.7	0.1	0.5	1.9	1.3	2.8	98.0	To-b (Mayogatai pumice)
12	77.5	0.1	13.2	1.5	0.1	0.5	1.8	1.2	4.1	97.6	To-b (Mayogatai pumice)
13	76.6	0.3	13.2	1.6	0.1	0.5	2.0	1.3	4.3	98.9	To-b (Mayogatai pumice)
14	77.2	0.3	13.1	1.5	0.0	0.5	1.9	1.3	4.2	97.6	To-b (Mayogatai pumice)

15	76.8	0.3	13.1	1.7	0.2	0.5	1.9	1.3	4.3	98.6	To-b (Mayogatai pumice)
16	77.4	0.3	13.1	1.6	0.0	0.5	1.8	1.3	4.2	97.9	To-b (Mayogatai pumice)
17	77.0	0.4	13.2	1.5	0.2	0.4	1.9	1.3	4.2	99.3	To-b (Mayogatai pumice)
18	76.6	0.3	13.2	1.6	0.1	0.5	2.0	1.3	4.3	98.9	To-b (Mayogatai pumice)
Ave.	77.1	0.3	13.1	1.6	0.1	0.5	1.9	1.3	4.1	98.3	
SD	0.5	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.4	0.6	

Sample No. 8	SiO ₂	TiO ₂	Al ₂ O ₃	FeO*	MnO	MgO	CaO	K ₂ O	Na ₂ O	Total**	Comment
1	76.5	0.5	12.8	2.1	0.2	0.4	1.9	1.4	4.3	96.3	To-Cu (Utarube ash)
2	74.0	0.5	14.2	2.1	0.2	0.6	3.0	1.1	4.2	98.6	To-Cu (Utarube ash)
3	76.5	0.5	12.9	2.0	0.0	0.4	2.2	1.3	4.3	97.5	To-Cu (Utarube ash)
4	75.9	0.5	13.1	2.2	0.1	0.5	2.3	1.6	3.9	94.8	To-Cu (Utarube ash)
5	75.3	0.6	13.2	2.4	0.1	0.6	2.3	1.4	4.1	98.5	To-Cu (Utarube ash)
6	75.8	0.7	12.7	2.7	0.2	0.8	2.1	1.3	3.8	99.8	To-Cu (Utarube ash)
7	77.2	0.3	12.8	2.1	0.0	0.6	2.0	1.2	3.9	97.0	To-Cu (Utarube ash)
8	75.9	0.4	13.1	2.3	0.1	0.6	2.2	1.3	4.0	98.0	To-Cu (Utarube ash)
9	77.1	0.4	12.6	2.0	0.1	0.5	2.0	1.5	3.8	94.8	To-Cu (Utarube ash)
10	73.2	0.5	14.8	2.1	0.2	0.6	3.3	1.1	4.3	98.1	To-Cu (Utarube ash)
11	78.3	0.5	12.2	1.8	0.1	0.3	1.4	1.6	3.9	96.1	To-Cu (Utarube ash)
12	75.6	0.6	13.2	2.2	0.2	0.5	2.3	1.4	4.1	96.1	To-Cu (Utarube ash)
13	75.3	0.6	13.1	2.5	0.4	0.5	2.2	1.3	4.0	98.7	To-Cu (Utarube ash)
14	76.2	0.4	13.0	2.2	0.1	0.6	2.2	1.3	3.9	94.5	To-Cu (Utarube ash)
15	75.9	0.4	13.1	2.3	0.1	0.6	2.3	1.3	3.9	97.2	To-Cu (Utarube ash)
16	75.7	0.5	13.1	2.4	0.1	0.7	2.3	1.3	4.0	95.5	To-Cu (Utarube ash)
17	76.8	0.4	13.0	2.2	0.0	0.5	1.9	1.3	4.0	97.6	To-Cu (Utarube ash)
18	75.4	0.6	13.2	2.4	0.1	0.6	2.4	1.3	4.0	97.8	To-Cu (Utarube ash)
19	74.9	0.4	13.5	2.6	0.1	0.7	2.5	1.2	4.1	98.0	To-Cu (Utarube ash)
20	77.8	0.6	11.9	2.2	0.1	0.7	1.7	1.5	3.8	95.1	To-Cu (Utarube ash)
21	70.7	0.5	16.5	1.6	0.1	0.5	4.8	0.6	4.8	99.0	To-Cu (Utarube ash)
22	75.6	0.5	13.1	2.4	0.3	0.6	2.3	1.6	3.8	95.2	To-Cu (Utarube ash)
23	74.4	0.4	14.4	1.9	0.1	0.4	2.8	1.1	4.6	98.3	To-Cu (Utarube ash)
24	77.0	0.4	12.6	2.1	0.1	0.5	1.8	1.5	4.0	97.5	To-Cu (Utarube ash)
Ave.	75.7	0.5	13.2	2.2	0.1	0.5	2.3	1.3	4.1	97.1	
SD	1.6	0.1	0.9	0.2	0.1	0.1	0.7	0.2	0.2	1.5	

Sample No. 9	SiO ₂	TiO ₂	Al ₂ O ₃	FeO*	MnO	MgO	CaO	K ₂ O	Na ₂ O	Total**	Comment
1	74.7	0.5	13.5	2.6	0.2	0.7	2.6	1.2	3.9	99.4	To-Cu (Utarube ash)
2	76.2	0.4	13.1	2.1	0.1	0.5	2.3	1.3	4.0	97.8	To-Cu (Utarube ash)
3	76.4	0.4	13.1	2.1	0.1	0.4	2.0	1.3	4.1	97.8	To-Cu (Utarube ash)
4	75.4	0.3	13.4	2.4	0.0	0.7	2.5	1.3	4.1	97.4	To-Cu (Utarube ash)
5	75.2	0.5	13.3	2.6	0.1	0.7	2.4	1.2	4.1	98.5	To-Cu (Utarube ash)
6	73.0	0.4	15.5	1.7	0.0	0.4	3.3	1.0	4.7	96.2	To-Cu (Utarube ash)
7	74.6	0.2	14.8	1.5	0.0	0.3	2.8	1.1	4.7	96.4	To-Cu (Utarube ash)
8	75.1	0.6	13.2	2.5	0.3	0.6	2.4	1.3	4.0	98.8	To-Cu (Utarube ash)
9	74.9	0.6	13.3	2.4	0.3	0.5	2.5	1.3	4.2	97.6	To-Cu (Utarube ash)
10	76.1	0.4	13.2	2.2	0.1	0.6	2.1	1.3	4.1	98.2	To-Cu (Utarube ash)
11	74.0	0.6	12.7	3.1	0.4	1.1	3.0	1.3	3.9	96.9	To-Cu (Utarube ash)
12	75.7	0.6	13.1	2.4	0.1	0.7	2.4	1.3	3.9	98.4	To-Cu (Utarube ash)
13	75.6	0.5	13.2	2.2	0.2	0.6	2.2	1.3	4.2	96.2	To-Cu (Utarube ash)
14	75.6	0.5	13.2	2.4	0.2	0.7	2.3	1.3	4.1	98.4	To-Cu (Utarube ash)
15	75.2	0.6	13.2	2.4	0.2	0.6	2.4	1.3	4.1	97.9	To-Cu (Utarube ash)
16	75.5	0.5	13.2	2.5	0.2	0.6	2.3	1.3	4.0	98.5	To-Cu (Utarube ash)
17	74.7	0.5	13.4	2.7	0.2	0.7	2.6	1.3	4.1	97.2	To-Cu (Utarube ash)
18	74.9	0.2	14.4	1.5	0.0	0.3	2.4	1.5	4.7	97.1	To-Cu (Utarube ash)
19	75.0	0.6	13.6	2.2	0.2	0.6	2.5	1.3	4.1	98.9	To-Cu (Utarube ash)
20	76.0	0.4	13.8	1.5	0.2	0.3	2.3	1.3	4.3	99.4	To-Cu (Utarube ash)
21	74.3	0.4	12.6	3.4	0.2	1.7	2.4	1.2	3.8	98.2	To-Cu (Utarube ash)
22	75.1	0.6	13.3	2.5	0.2	0.6	2.6	1.3	3.9	98.8	To-Cu (Utarube ash)
23	74.7	0.4	14.3	1.9	0.2	0.5	2.9	1.0	4.1	93.7	To-Cu (Utarube ash)
24	75.9	0.5	13.2	2.1	0.2	0.6	2.3	1.3	4.0	96.3	To-Cu (Utarube ash)
Ave.	75.2	0.5	13.5	2.3	0.2	0.6	2.5	1.3	4.1	97.7	
SD	0.8	0.1	0.7	0.5	0.1	0.3	0.3	0.1	0.3	1.3	

Sample No. 10	SiO ₂	TiO ₂	Al ₂ O ₃	FeO*	MnO	MgO	CaO	K ₂ O	Na ₂ O	Total**	Comment
1	75.9	0.5	13.1	2.4	0.1	0.6	2.3	1.3	3.9	98.0	To-Cu (Utarube ash)
2	75.0	0.5	13.6	2.4	0.2	0.6	2.4	1.3	4.1	97.7	To-Cu (Utarube ash)
3	77.0	0.4	12.7	1.9	0.1	0.4	2.0	1.3	4.1	97.5	To-Cu (Utarube ash)
4	76.0	0.2	13.8	1.8	0.0	0.3	2.3	1.1	4.4	95.1	To-Cu (Utarube ash)
5	79.0	0.1	12.6	1.2	0.0	0.4	1.6	1.3	3.9	93.5	To-Cu (Utarube ash)
6	77.1	0.4	12.5	2.4	0.1	0.5	1.8	1.5	3.9	95.9	To-Cu (Utarube ash)

7	75.0	0.6	13.0	2.5	0.3	0.8	2.4	1.4	4.2	97.1	To-Cu (Utarube ash)
8	76.4	0.2	13.7	1.8	0.0	0.4	2.4	1.1	4.0	98.5	To-Cu (Utarube ash)
9	76.2	0.5	13.1	2.1	0.1	0.6	2.2	1.2	4.0	96.2	To-Cu (Utarube ash)
10	72.9	0.6	15.0	2.0	0.2	0.5	3.3	1.2	4.5	99.1	To-Cu (Utarube ash)
11	73.0	0.4	15.0	2.1	0.3	0.5	3.3	1.1	4.3	99.9	To-Cu (Utarube ash)
12	75.1	0.7	13.3	2.4	0.3	0.7	2.4	1.3	4.1	98.1	To-Cu (Utarube ash)
13	75.8	0.4	13.2	2.4	0.2	0.6	2.2	1.3	4.1	96.8	To-Cu (Utarube ash)
14	75.8	0.6	13.0	2.4	0.2	0.5	2.1	1.3	4.1	98.3	To-Cu (Utarube ash)
15	76.3	0.6	12.8	2.2	0.2	0.3	2.2	1.4	4.1	99.0	To-Cu (Utarube ash)
16	75.8	0.5	13.0	2.6	0.1	0.6	2.3	1.2	3.9	93.7	To-Cu (Utarube ash)
17	77.5	0.5	12.2	2.2	0.1	0.4	1.7	1.4	4.0	94.7	To-Cu (Utarube ash)
18	75.2	0.5	13.2	2.5	0.3	0.6	2.3	1.3	4.1	98.0	To-Cu (Utarube ash)
19	75.5	0.6	13.2	2.3	0.2	0.5	2.4	1.3	4.1	96.1	To-Cu (Utarube ash)
20	75.4	0.6	12.4	2.8	0.3	1.0	2.2	1.4	3.9	99.8	To-Cu (Utarube ash)
21	72.9	0.4	15.4	1.7	0.1	0.3	3.5	1.2	4.6	97.9	To-Cu (Utarube ash)
22	74.8	0.6	13.3	2.7	0.2	0.8	2.4	1.2	4.0	98.3	To-Cu (Utarube ash)
23	76.3	0.5	12.8	2.3	0.2	0.6	1.8	1.4	4.1	95.9	To-Cu (Utarube ash)
Ave.	75.6	0.5	13.3	2.2	0.1	0.5	2.3	1.3	4.1	97.2	
SD	1.4	0.1	0.8	0.4	0.1	0.2	0.5	0.1	0.2	1.8	

Sample No. 11	SiO ₂	TiO ₂	Al ₂ O ₃	FeO*	MnO	MgO	CaO	K ₂ O	Na ₂ O	Total**	Comment
1	70.9	0.3	16.9	1.6	0.1	0.3	4.2	0.8	5.0	96.7	To-Cu (Utarube ash)
2	76.3	0.4	13.1	2.2	0.0	0.6	2.3	1.3	3.9	97.6	To-Cu (Utarube ash)
3	75.1	0.5	12.8	2.8	0.1	1.1	2.4	1.2	3.9	98.0	To-Cu (Utarube ash)
4	74.7	0.6	13.6	2.4	0.1	0.8	2.6	1.2	4.1	98.5	To-Cu (Utarube ash)
5	72.6	0.3	16.1	1.2	0.1	0.2	3.5	1.1	4.8	97.3	To-Cu (Utarube ash)
6	74.8	0.5	13.6	2.5	0.2	0.7	2.6	1.3	4.0	96.5	To-Cu (Utarube ash)
7	74.4	0.6	13.7	2.5	0.2	0.7	2.8	1.2	4.0	99.7	To-Cu (Utarube ash)
8	76.4	0.4	13.0	2.1	0.1	0.5	2.2	1.3	4.1	95.8	To-Cu (Utarube ash)
9	75.5	0.6	13.2	2.3	0.3	0.6	2.4	1.3	3.9	97.7	To-Cu (Utarube ash)
10	76.0	0.4	13.2	2.1	0.2	0.5	2.3	1.4	4.0	96.7	To-Cu (Utarube ash)
11	74.5	0.5	13.5	2.6	0.2	0.7	2.7	1.2	4.2	96.0	To-Cu (Utarube ash)
12	70.0	0.2	17.6	1.8	0.0	0.5	4.5	0.8	4.7	98.9	To-Cu (Utarube ash)
13	75.5	0.5	13.2	2.5	0.2	0.6	2.3	1.3	3.9	98.5	To-Cu (Utarube ash)
14	75.8	0.6	13.0	2.4	0.1	0.6	2.2	1.3	3.9	97.6	To-Cu (Utarube ash)
15	74.9	0.5	13.7	2.4	0.1	0.7	2.6	1.2	4.0	97.6	To-Cu (Utarube ash)
16	75.5	0.5	13.2	2.3	0.1	0.7	2.4	1.2	4.1	98.4	To-Cu (Utarube ash)
17	75.7	0.5	13.2	2.2	0.1	0.7	2.4	1.3	3.9	98.6	To-Cu (Utarube ash)
18	77.3	0.3	12.8	1.8	0.1	0.5	1.8	1.4	4.0	99.1	To-Cu (Utarube ash)
19	76.1	0.5	13.1	2.3	0.1	0.5	2.2	1.3	4.0	97.4	To-Cu (Utarube ash)
20	73.2	0.3	15.4	1.9	0.0	0.5	3.4	1.0	4.4	97.4	To-Cu (Utarube ash)
Ave.	74.7	0.4	13.9	2.2	0.1	0.6	2.7	1.2	4.1	97.7	
SD	1.8	0.1	1.4	0.4	0.1	0.2	0.7	0.2	0.3	1.0	

Sample No. 12	SiO ₂	TiO ₂	Al ₂ O ₃	FeO*	MnO	MgO	CaO	K ₂ O	Na ₂ O	Total**	Comment
1	75.6	0.4	13.2	2.4	0.1	0.7	2.4	1.3	4.0	98.6	To-Cu (Utarube ash)
2	76.9	0.4	12.9	2.0	0.0	0.5	2.0	1.3	4.0	95.7	To-Cu (Utarube ash)
3	72.9	0.4	14.4	2.4	0.2	1.0	3.2	1.2	4.3	98.8	To-Cu (Utarube ash)
4	75.3	0.5	13.4	2.2	0.1	0.7	2.4	1.3	4.0	97.8	To-Cu (Utarube ash)
5	75.7	0.4	13.4	2.2	0.1	0.7	2.4	1.2	4.0	97.5	To-Cu (Utarube ash)
6	75.7	0.6	13.1	2.4	0.2	0.6	2.2	1.2	3.9	98.1	To-Cu (Utarube ash)
7	75.1	0.3	14.3	1.9	0.0	0.4	2.6	1.2	4.3	97.7	To-Cu (Utarube ash)
8	75.6	0.6	13.1	2.3	0.2	0.7	2.3	1.4	4.0	98.7	To-Cu (Utarube ash)
9	74.6	0.6	13.5	2.5	0.3	0.7	2.6	1.3	3.9	98.0	To-Cu (Utarube ash)
10	75.7	0.4	13.2	2.3	0.1	0.7	2.3	1.3	4.2	95.8	To-Cu (Utarube ash)
11	76.0	0.5	13.6	2.4	0.1	0.6	2.5	1.2	3.1	96.7	To-Cu (Utarube ash)
12	75.2	0.5	12.9	2.5	0.2	1.2	2.5	1.3	3.8	98.0	To-Cu (Utarube ash)
13	75.5	0.5	13.5	2.4	0.2	0.7	2.3	1.2	3.8	98.6	To-Cu (Utarube ash)
14	69.5	0.4	17.5	1.7	0.2	0.5	4.6	0.9	4.7	99.0	To-Cu (Utarube ash)
15	75.9	0.6	13.2	2.4	0.2	0.5	2.3	1.2	3.8	98.9	To-Cu (Utarube ash)
16	75.1	0.5	13.5	2.3	0.1	0.7	2.6	1.3	4.0	98.4	To-Cu (Utarube ash)
17	74.8	0.2	14.5	2.2	0.0	0.6	2.9	1.0	3.9	98.1	To-Cu (Utarube ash)
18	74.8	0.6	13.7	2.4	0.2	0.7	2.6	1.2	4.0	98.5	To-Cu (Utarube ash)
19	76.3	0.3	13.4	2.2	0.0	0.6	2.3	1.2	3.8	97.2	To-Cu (Utarube ash)
20	76.4	0.4	13.0	2.1	0.1	0.6	2.2	1.3	3.9	97.5	To-Cu (Utarube ash)
Ave.	75.1	0.4	13.7	2.3	0.1	0.7	2.6	1.2	4.0	97.9	
SD	1.6	0.1	1.0	0.2	0.1	0.2	0.6	0.1	0.3	0.9	

Sample No. 13	SiO ₂	TiO ₂	Al ₂ O ₃	FeO*	MnO	MgO	CaO	K ₂ O	Na ₂ O	Total**	Comment
1	76.8	0.6	11.5	3.1	0.2	1.0	1.6	1.3	3.9	96.4	To-Cu (Utarube ash)

2	74.9	0.6	13.2	2.7	0.3	0.6	2.5	1.3	4.0	97.7	To-Cu (Utarube ash)
3	76.2	0.3	13.3	2.1	0.0	0.6	2.3	1.2	4.0	97.2	To-Cu (Utarube ash)
4	75.9	0.5	13.0	2.3	0.1	0.6	2.2	1.4	4.0	97.8	To-Cu (Utarube ash)
5	75.7	0.5	13.0	2.3	0.2	0.6	2.3	1.3	4.1	96.2	To-Cu (Utarube ash)
6	77.6	0.4	12.6	2.0	0.0	0.4	1.8	1.3	4.0	99.1	To-Cu (Utarube ash)
7	77.0	0.6	11.6	2.7	0.2	0.8	1.8	1.5	3.8	95.8	To-Cu (Utarube ash)
8	76.9	0.5	12.6	2.0	0.2	0.4	2.0	1.4	4.0	98.1	To-Cu (Utarube ash)
9	76.3	0.5	13.0	2.4	0.1	0.6	2.2	1.3	3.7	97.4	To-Cu (Utarube ash)
10	78.4	0.4	12.0	1.9	0.0	0.5	1.7	1.4	3.8	96.7	To-Cu (Utarube ash)
11	74.8	0.5	13.7	2.3	0.2	0.6	2.7	1.3	4.0	96.8	To-Cu (Utarube ash)
12	77.8	0.4	12.4	2.1	0.0	0.4	1.7	1.3	3.9	97.1	To-Cu (Utarube ash)
13	68.8	0.2	18.8	1.2	0.0	0.3	5.2	0.7	4.9	98.7	To-Cu (Utarube ash)
14	75.3	0.6	13.2	2.4	0.2	0.6	2.4	1.3	4.0	95.0	To-Cu (Utarube ash)
15	78.0	0.4	12.3	2.2	0.0	0.4	1.6	1.3	3.8	95.9	To-Cu (Utarube ash)
16	75.3	0.5	13.3	2.3	0.1	0.7	2.5	1.3	4.1	98.5	To-Cu (Utarube ash)
17	74.4	0.4	14.4	2.0	0.1	0.4	2.7	1.2	4.4	96.7	To-Cu (Utarube ash)
18	76.8	0.4	12.7	1.9	0.2	0.5	2.0	1.4	4.1	95.8	To-Cu (Utarube ash)
19	76.2	0.4	13.2	2.0	0.1	0.5	2.2	1.3	4.3	95.0	To-Cu (Utarube ash)
20	77.0	0.5	12.7	1.9	0.1	0.4	2.1	1.4	4.0	95.6	To-Cu (Utarube ash)
21	76.6	0.5	12.8	2.1	0.1	0.3	2.0	1.3	4.2	97.5	To-Cu (Utarube ash)
Ave.	76.0	0.5	13.1	2.2	0.1	0.5	2.3	1.3	4.0	96.9	
SD	2.0	0.1	1.5	0.4	0.1	0.2	0.7	0.1	0.3	1.2	

Sample No. 14	SiO ₂	TiO ₂	Al ₂ O ₃	FeO*	MnO	MgO	CaO	K ₂ O	Na ₂ O	Total**	Comment
1	75.7	0.5	13.3	2.1	0.2	0.6	2.3	1.3	4.1	96.4	To-Cu (Utarube ash)
2	71.7	0.4	16.3	1.8	0.0	0.5	3.9	1.0	4.5	99.7	To-Cu (Utarube ash)
3	71.7	0.4	16.1	1.8	0.2	0.6	3.7	1.0	4.6	98.8	To-Cu (Utarube ash)
4	77.8	0.5	12.1	2.1	0.2	0.3	1.7	1.4	3.9	98.0	To-Cu (Utarube ash)
5	73.7	0.5	14.2	2.3	0.2	0.6	2.9	1.2	4.4	99.1	To-Cu (Utarube ash)
6	75.1	0.5	13.4	2.4	0.3	0.7	2.4	1.3	3.9	98.3	To-Cu (Utarube ash)
7	75.6	0.3	13.8	2.1	0.0	0.5	2.4	1.2	4.1	97.9	To-Cu (Utarube ash)
8	74.8	0.5	13.6	2.4	0.1	0.7	2.7	1.2	4.1	97.7	To-Cu (Utarube ash)
9	74.9	0.6	13.4	2.6	0.2	0.7	2.4	1.3	4.0	98.2	To-Cu (Utarube ash)
10	75.1	0.5	13.2	2.6	0.2	0.6	2.4	1.4	4.0	95.7	To-Cu (Utarube ash)
11	75.5	0.5	13.4	2.3	0.2	0.6	2.4	1.2	4.0	98.3	To-Cu (Utarube ash)
12	75.4	0.4	13.8	2.0	0.0	0.4	2.7	1.1	4.3	98.1	To-Cu (Utarube ash)
13	78.4	0.2	12.4	1.5	0.1	0.4	1.6	1.4	4.1	97.5	To-Cu (Utarube ash)
14	74.9	0.4	13.8	2.3	0.2	0.7	2.6	1.2	4.0	98.6	To-Cu (Utarube ash)
15	75.4	0.6	11.8	3.2	0.3	1.3	2.2	1.4	3.7	97.4	To-Cu (Utarube ash)
16	75.0	0.6	12.9	2.6	0.3	0.8	2.5	1.3	4.1	97.4	To-Cu (Utarube ash)
17	69.7	0.4	17.4	1.7	0.1	0.4	4.5	1.0	4.9	98.4	To-Cu (Utarube ash)
18	75.3	0.6	13.1	2.4	0.2	0.6	2.4	1.3	4.1	97.5	To-Cu (Utarube ash)
19	75.1	0.5	13.4	2.5	0.2	0.7	2.4	1.3	4.0	97.7	To-Cu (Utarube ash)
20	75.4	0.7	13.2	2.4	0.2	0.6	2.3	1.3	4.0	98.4	To-Cu (Utarube ash)
Ave.	74.8	0.5	13.7	2.3	0.2	0.6	2.6	1.2	4.1	98.0	
SD	1.9	0.1	1.4	0.4	0.1	0.2	0.7	0.1	0.3	0.9	

Sample No. 15	SiO ₂	TiO ₂	Al ₂ O ₃	FeO*	MnO	MgO	CaO	K ₂ O	Na ₂ O	Total**	Comment
1	74.7	0.5	13.6	2.5	0.2	0.7	2.5	1.3	4.0	97.3	To-Cu (Utarube ash)
2	76.7	0.4	12.7	2.1	0.1	0.6	2.1	1.3	4.0	96.0	To-Cu (Utarube ash)
3	74.2	0.6	13.6	2.7	0.2	0.7	2.7	1.3	4.0	98.1	To-Cu (Utarube ash)
4	74.2	0.6	13.6	2.6	0.2	0.7	2.8	1.2	4.0	98.0	To-Cu (Utarube ash)
5	75.2	0.5	13.7	2.7	0.2	0.7	2.6	1.3	3.1	97.3	To-Cu (Utarube ash)
6	74.8	0.5	13.7	2.4	0.1	0.7	2.6	1.2	4.0	97.9	To-Cu (Utarube ash)
7	76.5	0.4	13.0	2.1	0.2	0.5	2.1	1.3	4.0	95.4	To-Cu (Utarube ash)
8	74.3	0.6	13.7	2.6	0.3	0.7	2.7	1.2	4.0	99.2	To-Cu (Utarube ash)
9	75.4	0.6	12.9	2.4	0.3	0.7	2.2	1.3	4.1	96.0	To-Cu (Utarube ash)
10	74.8	0.5	13.6	2.5	0.2	0.6	2.6	1.2	4.1	99.1	To-Cu (Utarube ash)
11	76.3	0.3	13.3	2.0	0.1	0.6	2.3	1.3	3.9	96.8	To-Cu (Utarube ash)
12	75.2	0.5	13.6	2.1	0.2	0.4	2.6	1.2	4.1	98.1	To-Cu (Utarube ash)
13	76.0	0.6	13.0	2.3	0.2	0.6	2.3	1.3	3.8	97.7	To-Cu (Utarube ash)
14	75.9	0.5	13.5	1.8	0.2	0.4	2.4	1.2	4.1	99.1	To-Cu (Utarube ash)
15	74.6	0.5	13.5	2.6	0.2	0.7	2.7	1.2	4.0	96.1	To-Cu (Utarube ash)
16	75.2	0.6	13.3	2.5	0.1	0.7	2.4	1.3	4.0	96.4	To-Cu (Utarube ash)
17	75.9	0.3	13.6	2.0	0.0	0.7	2.4	1.2	3.9	96.2	To-Cu (Utarube ash)
18	74.2	0.3	14.6	2.1	0.0	0.5	3.0	1.1	4.2	97.1	To-Cu (Utarube ash)
19	74.8	0.4	13.5	2.5	0.2	0.7	2.7	1.2	4.0	97.4	To-Cu (Utarube ash)
20	74.8	0.3	13.6	2.5	0.0	0.7	2.7	1.3	4.1	94.3	To-Cu (Utarube ash)
21	74.5	0.7	13.5	2.6	0.2	0.7	2.7	1.3	3.9	98.3	To-Cu (Utarube ash)
Ave.	75.2	0.5	13.5	2.4	0.2	0.6	2.5	1.2	4.0	97.2	

SD 0.8 0.1 0.4 0.3 0.1 0.1 0.2 0.1 0.2 1.3

Sample No. 16	SiO ₂	TiO ₂	Al ₂ O ₃	FeO*	MnO	MgO	CaO	K ₂ O	Na ₂ O	Total**	Comment
1	75.1	0.6	13.5	2.4	0.2	0.6	2.6	1.3	3.9	97.6	To-Cu (Utarube ash)
2	75.1	0.4	13.8	2.2	0.1	0.6	2.5	1.2	4.2	99.0	To-Cu (Utarube ash)
3	77.2	0.4	12.7	1.7	0.1	0.4	2.0	1.4	4.1	98.0	To-Cu (Utarube ash)
4	74.6	0.6	13.5	2.5	0.3	0.7	2.5	1.2	4.1	99.9	To-Cu (Utarube ash)
5	74.9	0.5	13.6	2.4	0.1	0.7	2.6	1.2	4.0	98.5	To-Cu (Utarube ash)
6	74.5	0.5	13.9	2.3	0.1	0.7	2.7	1.2	4.1	98.4	To-Cu (Utarube ash)
7	75.4	0.6	13.0	2.5	0.3	0.7	2.5	1.2	3.9	98.6	To-Cu (Utarube ash)
8	74.6	0.4	13.8	2.4	0.2	0.8	2.6	1.2	4.1	99.3	To-Cu (Utarube ash)
9	78.3	0.3	12.4	1.4	0.0	0.4	1.8	1.4	4.1	94.5	To-Cu (Utarube ash)
10	75.5	0.4	13.4	2.4	0.2	0.7	2.4	1.2	4.0	98.4	To-Cu (Utarube ash)
11	74.3	0.5	13.6	2.7	0.2	0.7	2.7	1.2	4.0	99.5	To-Cu (Utarube ash)
12	74.5	0.5	13.8	2.5	0.1	0.7	2.7	1.3	4.0	99.4	To-Cu (Utarube ash)
13	74.8	0.5	13.6	2.5	0.2	0.7	2.6	1.2	4.0	97.9	To-Cu (Utarube ash)
14	74.8	0.6	13.8	2.4	0.1	0.6	2.6	1.2	4.1	98.3	To-Cu (Utarube ash)
15	77.9	0.3	12.6	1.6	0.1	0.5	1.9	1.3	4.0	98.7	To-Cu (Utarube ash)
16	75.1	0.5	13.5	2.3	0.2	0.6	2.6	1.3	4.0	99.0	To-Cu (Utarube ash)
17	74.7	0.5	13.6	2.4	0.1	0.7	2.7	1.3	4.0	96.7	To-Cu (Utarube ash)
18	74.7	0.5	13.7	2.5	0.1	0.7	2.6	1.1	4.0	98.9	To-Cu (Utarube ash)
19	75.6	0.5	13.3	2.3	0.2	0.6	2.3	1.2	4.0	97.8	To-Cu (Utarube ash)
20	74.9	0.4	13.6	2.5	0.2	0.7	2.6	1.2	4.1	98.0	To-Cu (Utarube ash)
Ave.	75.3	0.5	13.4	2.3	0.1	0.6	2.5	1.2	4.0	98.3	
SD	1.1	0.1	0.4	0.3	0.1	0.1	0.3	0.1	0.1	1.2	

Sample No. 17	SiO ₂	TiO ₂	Al ₂ O ₃	FeO*	MnO	MgO	CaO	K ₂ O	Na ₂ O	Total**	Comment
1	75.9	0.6	13.2	2.1	0.1	0.6	2.5	1.3	3.9	98.3	To-Cu (Kanegasawa pumice)
2	74.0	0.5	14.0	2.4	0.2	0.7	2.8	1.2	4.1	99.4	To-Cu (Kanegasawa pumice)
3	74.5	0.5	13.7	2.4	0.1	0.7	2.8	1.2	4.1	99.3	To-Cu (Kanegasawa pumice)
4	74.7	0.5	13.7	2.3	0.2	0.7	2.6	1.2	4.0	99.3	To-Cu (Kanegasawa pumice)
5	74.7	0.5	13.8	2.4	0.1	0.7	2.7	1.2	4.0	98.7	To-Cu (Kanegasawa pumice)
6	75.0	0.4	13.7	2.3	0.0	0.7	2.7	1.2	4.1	98.9	To-Cu (Kanegasawa pumice)
7	74.6	0.6	13.5	2.5	0.2	0.7	2.7	1.2	4.0	98.4	To-Cu (Kanegasawa pumice)
8	74.7	0.5	13.8	2.3	0.2	0.7	2.6	1.3	4.1	98.6	To-Cu (Kanegasawa pumice)
9	74.7	0.6	13.7	2.4	0.2	0.7	2.6	1.1	4.1	98.8	To-Cu (Kanegasawa pumice)
10	74.7	0.5	13.7	2.5	0.2	0.7	2.6	1.2	4.1	98.4	To-Cu (Kanegasawa pumice)
11	74.7	0.5	13.6	2.4	0.2	0.7	2.8	1.3	4.0	97.8	To-Cu (Kanegasawa pumice)
12	71.0	0.4	16.4	1.8	0.2	0.4	4.1	0.9	4.7	98.5	To-Cu (Kanegasawa pumice)
13	74.5	0.5	13.6	2.5	0.2	0.7	2.7	1.2	4.0	99.1	To-Cu (Kanegasawa pumice)
14	75.7	0.3	13.4	2.4	0.0	0.6	2.5	1.2	4.0	98.6	To-Cu (Kanegasawa pumice)
15	74.6	0.5	13.7	2.4	0.1	0.7	2.7	1.2	4.1	99.0	To-Cu (Kanegasawa pumice)
16	74.9	0.5	13.7	2.5	0.2	0.6	2.6	1.2	4.0	99.1	To-Cu (Kanegasawa pumice)
17	74.3	0.6	13.6	2.5	0.2	0.7	2.8	1.3	4.0	99.0	To-Cu (Kanegasawa pumice)
18	74.6	0.5	13.9	2.4	0.1	0.7	2.6	1.1	4.1	98.9	To-Cu (Kanegasawa pumice)
19	74.9	0.4	13.7	2.4	0.2	0.7	2.6	1.2	4.0	98.1	To-Cu (Kanegasawa pumice)
20	74.6	0.5	13.8	2.4	0.2	0.7	2.6	1.1	4.1	98.0	To-Cu (Kanegasawa pumice)
21	74.6	0.5	13.7	2.5	0.2	0.8	2.7	1.1	4.0	98.7	To-Cu (Kanegasawa pumice)
Ave.	74.6	0.5	13.8	2.4	0.2	0.7	2.7	1.2	4.1	98.7	
SD	0.9	0.1	0.6	0.2	0.1	0.1	0.3	0.1	0.2	0.4	

Sample No. 18	SiO ₂	TiO ₂	Al ₂ O ₃	FeO*	MnO	MgO	CaO	K ₂ O	Na ₂ O	Total**	Comment
1	74.6	0.5	13.7	2.5	0.1	0.7	2.7	1.2	4.1	99.5	To-Cu (Kanegasawa pumice)
2	74.7	0.5	13.8	2.4	0.3	0.6	2.6	1.1	4.0	99.2	To-Cu (Kanegasawa pumice)
3	74.6	0.5	13.6	2.5	0.1	0.6	2.7	1.2	4.2	94.2	To-Cu (Kanegasawa pumice)
4	74.6	0.5	13.8	2.5	0.2	0.7	2.6	1.3	3.9	99.3	To-Cu (Kanegasawa pumice)
5	74.9	0.5	13.7	2.4	0.1	0.7	2.6	1.2	4.0	98.9	To-Cu (Kanegasawa pumice)
6	74.5	0.5	13.6	2.6	0.2	0.7	2.7	1.2	4.0	99.2	To-Cu (Kanegasawa pumice)
7	74.4	0.5	13.7	2.6	0.2	0.7	2.7	1.1	4.0	98.9	To-Cu (Kanegasawa pumice)
8	74.6	0.5	13.8	2.5	0.1	0.7	2.6	1.2	4.0	98.9	To-Cu (Kanegasawa pumice)
9	74.7	0.5	13.7	2.5	0.1	0.7	2.6	1.2	4.0	98.6	To-Cu (Kanegasawa pumice)
10	74.0	0.5	13.9	2.8	0.2	0.8	2.8	1.1	3.9	99.4	To-Cu (Kanegasawa pumice)
11	74.7	0.5	13.7	2.4	0.1	0.7	2.7	1.3	4.0	99.0	To-Cu (Kanegasawa pumice)
12	74.6	0.5	13.8	2.5	0.1	0.7	2.7	1.1	3.9	99.4	To-Cu (Kanegasawa pumice)
13	74.4	0.5	13.8	2.6	0.1	0.7	2.8	1.2	3.8	98.3	To-Cu (Kanegasawa pumice)
14	74.3	0.6	13.5	2.6	0.3	0.7	2.7	1.2	4.0	100.0	To-Cu (Kanegasawa pumice)
15	74.4	0.5	13.6	2.5	0.2	0.7	2.8	1.3	4.0	99.6	To-Cu (Kanegasawa pumice)
16	74.6	0.5	13.7	2.4	0.2	0.8	2.8	1.2	4.0	98.7	To-Cu (Kanegasawa pumice)
17	74.4	0.6	13.6	2.6	0.3	0.7	2.7	1.3	3.9	99.3	To-Cu (Kanegasawa pumice)
18	74.5	0.5	13.5	2.6	0.2	0.7	2.8	1.2	3.9	97.3	To-Cu (Kanegasawa pumice)

19	74.5	0.6	13.6	2.5	0.2	0.7	2.8	1.3	3.9	99.0	To-Cu (Kanegasawa pumice)
20	73.9	0.5	13.6	2.7	0.2	0.8	2.9	1.3	4.1	99.0	To-Cu (Kanegasawa pumice)
Ave.	74.5	0.5	13.7	2.5	0.2	0.7	2.7	1.2	4.0	98.8	
SD	0.2	0.0	0.1	0.1	0.1	0.0	0.1	0.1	0.1	1.2	

Sample No. 19	SiO ₂	TiO ₂	Al ₂ O ₃	FeO*	MnO	MgO	CaO	K ₂ O	Na ₂ O	Total**	Comment
1	74.2	0.6	13.5	2.6	0.2	0.7	2.7	1.2	4.2	93.1	To-Cu (Chuseri pumice)
2	74.6	0.6	13.5	2.6	0.3	0.7	2.6	1.2	4.0	99.5	To-Cu (Chuseri pumice)
3	74.8	0.5	13.6	2.4	0.1	0.7	2.7	1.2	4.0	98.5	To-Cu (Chuseri pumice)
4	74.4	0.6	13.5	2.7	0.3	0.5	2.7	1.2	4.1	99.0	To-Cu (Chuseri pumice)
5	74.7	0.5	13.6	2.5	0.2	0.7	2.6	1.2	3.9	99.2	To-Cu (Chuseri pumice)
6	74.5	0.6	13.7	2.5	0.2	0.7	2.7	1.3	4.0	98.5	To-Cu (Chuseri pumice)
7	74.3	0.5	14.4	1.9	0.1	0.5	2.8	1.2	4.4	99.7	To-Cu (Chuseri pumice)
8	74.8	0.5	13.7	2.5	0.2	0.7	2.7	1.1	3.9	98.3	To-Cu (Chuseri pumice)
9	74.4	0.6	13.2	2.9	0.3	0.7	2.6	1.1	4.2	97.6	To-Cu (Chuseri pumice)
10	74.8	0.5	13.6	2.4	0.2	0.7	2.6	1.2	4.0	98.8	To-Cu (Chuseri pumice)
11	74.3	0.6	13.6	2.6	0.3	0.7	2.7	1.3	4.0	98.8	To-Cu (Chuseri pumice)
12	74.1	0.6	13.6	2.6	0.3	0.7	2.8	1.2	4.1	97.8	To-Cu (Chuseri pumice)
13	74.7	0.5	13.7	2.5	0.2	0.7	2.7	1.2	4.0	97.3	To-Cu (Chuseri pumice)
14	73.2	0.6	14.6	2.4	0.2	0.6	3.3	1.0	4.1	98.6	To-Cu (Chuseri pumice)
15	74.7	0.5	13.5	2.3	0.2	0.7	2.7	1.2	4.1	98.0	To-Cu (Chuseri pumice)
16	74.6	0.5	13.7	2.4	0.2	0.7	2.7	1.2	4.0	98.8	To-Cu (Chuseri pumice)
17	74.4	0.6	13.7	2.5	0.1	0.7	2.8	1.2	4.0	98.7	To-Cu (Chuseri pumice)
18	74.7	0.5	13.6	2.5	0.2	0.7	2.7	1.2	4.0	99.1	To-Cu (Chuseri pumice)
19	74.5	0.5	13.7	2.6	0.2	0.8	2.7	1.2	3.9	99.0	To-Cu (Chuseri pumice)
20	75.4	0.3	13.8	2.1	0.0	0.6	2.7	1.1	3.9	97.8	To-Cu (Chuseri pumice)
Ave.	74.5	0.5	13.7	2.5	0.2	0.7	2.7	1.2	4.0	98.3	
SD	0.4	0.1	0.3	0.2	0.1	0.1	0.1	0.1	0.1	1.4	

Sample No. 20	SiO ₂	TiO ₂	Al ₂ O ₃	FeO*	MnO	MgO	CaO	K ₂ O	Na ₂ O	Total**	Comment
1	74.8	0.5	13.6	2.4	0.2	0.7	2.7	1.1	4.0	97.8	To-Cu (Chuseri pumice)
2	74.6	0.5	13.7	2.4	0.2	0.7	2.7	1.2	4.0	99.6	To-Cu (Chuseri pumice)
3	74.4	0.5	13.8	2.7	0.1	0.6	2.7	1.2	4.0	99.6	To-Cu (Chuseri pumice)
4	74.1	0.7	13.6	2.6	0.2	0.7	2.9	1.3	4.0	99.6	To-Cu (Chuseri pumice)
5	74.3	0.5	13.7	2.5	0.2	0.8	2.7	1.2	4.0	99.9	To-Cu (Chuseri pumice)
6	74.2	0.5	13.7	2.6	0.2	0.7	2.8	1.3	4.1	99.2	To-Cu (Chuseri pumice)
7	74.6	0.5	13.6	2.4	0.1	0.7	2.7	1.3	4.0	95.4	To-Cu (Chuseri pumice)
8	74.3	0.6	13.7	2.5	0.3	0.8	2.7	1.2	4.0	99.4	To-Cu (Chuseri pumice)
9	74.2	0.5	13.8	2.6	0.2	0.8	2.7	1.2	4.0	94.0	To-Cu (Chuseri pumice)
10	74.3	0.6	13.6	2.6	0.3	0.7	2.7	1.2	4.0	99.9	To-Cu (Chuseri pumice)
11	74.7	0.5	13.7	2.6	0.1	0.7	2.7	1.1	3.9	98.8	To-Cu (Chuseri pumice)
12	74.2	0.6	13.7	2.5	0.3	0.8	2.8	1.2	4.0	99.1	To-Cu (Chuseri pumice)
13	74.7	0.5	13.7	2.4	0.1	0.7	2.7	1.2	4.0	98.9	To-Cu (Chuseri pumice)
14	74.4	0.5	13.8	2.4	0.2	0.8	2.7	1.3	4.0	99.9	To-Cu (Chuseri pumice)
15	74.4	0.6	13.5	2.6	0.2	0.6	2.7	1.2	4.1	99.3	To-Cu (Chuseri pumice)
16	74.6	0.5	13.6	2.5	0.2	0.7	2.7	1.2	4.0	99.5	To-Cu (Chuseri pumice)
17	74.4	0.6	13.8	2.6	0.2	0.7	2.7	1.2	3.9	99.5	To-Cu (Chuseri pumice)
18	74.7	0.5	13.7	2.5	0.3	0.7	2.6	1.2	4.0	99.2	To-Cu (Chuseri pumice)
19	72.9	0.6	14.1	2.9	0.1	0.9	3.3	1.1	4.1	99.4	To-Cu (Chuseri pumice)
20	74.5	0.7	13.6	2.6	0.2	0.6	2.7	1.3	4.0	99.1	To-Cu (Chuseri pumice)
Ave.	74.4	0.5	13.7	2.5	0.2	0.7	2.8	1.2	4.0	98.9	
SD	0.4	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	1.5	

Sample No. 21	SiO ₂	TiO ₂	Al ₂ O ₃	FeO*	MnO	MgO	CaO	K ₂ O	Na ₂ O	Total**	Comment
1	74.3	0.6	13.7	2.5	0.1	0.7	2.9	1.3	4.0	98.8	To-Cu (Chuseri pumice)
2	75.0	0.5	13.7	2.4	0.1	0.6	2.6	1.1	4.0	98.9	To-Cu (Chuseri pumice)
3	74.0	0.6	13.8	2.5	0.3	0.8	2.8	1.2	4.1	97.2	To-Cu (Chuseri pumice)
4	75.2	0.4	13.6	2.3	0.0	0.6	2.6	1.1	4.2	98.7	To-Cu (Chuseri pumice)
5	74.4	0.5	13.7	2.5	0.2	0.7	2.9	1.2	4.0	98.8	To-Cu (Chuseri pumice)
6	74.3	0.5	14.0	2.4	0.2	0.7	2.7	1.3	3.9	94.2	To-Cu (Chuseri pumice)
7	74.4	0.6	13.6	2.4	0.2	0.7	2.8	1.3	4.1	96.9	To-Cu (Chuseri pumice)
8	74.6	0.6	13.7	2.5	0.2	0.7	2.6	1.2	3.9	98.0	To-Cu (Chuseri pumice)
9	74.3	0.6	13.8	2.6	0.2	0.7	2.8	1.2	4.0	98.3	To-Cu (Chuseri pumice)
10	74.3	0.6	13.7	2.4	0.2	0.8	2.8	1.2	4.0	99.5	To-Cu (Chuseri pumice)
11	74.6	0.5	13.6	2.4	0.1	0.8	2.9	1.2	4.0	95.1	To-Cu (Chuseri pumice)
12	74.4	0.6	13.7	2.6	0.2	0.7	2.8	1.2	3.9	98.9	To-Cu (Chuseri pumice)
13	75.0	0.4	13.7	2.5	0.1	0.6	2.6	1.1	4.0	96.7	To-Cu (Chuseri pumice)
14	74.1	0.5	13.7	2.6	0.2	0.7	2.9	1.2	4.1	99.3	To-Cu (Chuseri pumice)
15	74.6	0.6	13.8	2.4	0.1	0.7	2.6	1.2	4.0	98.2	To-Cu (Chuseri pumice)
16	74.6	0.4	13.8	2.4	0.2	0.7	2.8	1.2	3.9	98.3	To-Cu (Chuseri pumice)

17	74.5	0.5	13.7	2.6	0.1	0.7	2.7	1.2	4.0	99.5	To-Cu (Chuseri pumice)
18	74.6	0.4	13.8	2.3	0.1	0.8	2.7	1.2	4.1	98.4	To-Cu (Chuseri pumice)
19	74.4	0.6	13.6	2.4	0.3	0.7	2.8	1.2	4.0	98.8	To-Cu (Chuseri pumice)
20	74.6	0.6	13.8	2.3	0.2	0.8	2.7	1.2	4.0	98.8	To-Cu (Chuseri pumice)
Ave.	74.5	0.5	13.7	2.4	0.2	0.7	2.8	1.2	4.0	98.1	
SD	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	1.4	

Sample No. 22	SiO ₂	TiO ₂	Al ₂ O ₃	FeO*	MnO	MgO	CaO	K ₂ O	Na ₂ O	Total**	Comment
1	79.5	0.4	11.8	1.2	0.0	0.2	2.3	1.0	3.7	98.5	D' Herai ash
2	70.6	0.4	16.9	1.6	0.2	0.3	3.8	1.2	5.2	98.0	D' Herai ash
3	74.3	0.7	14.0	2.3	0.1	0.5	2.8	1.2	4.2	98.8	D' Herai ash
4	72.2	0.3	16.0	1.4	0.2	0.3	3.7	0.8	5.1	92.5	D' Herai ash
5	73.8	0.2	15.4	1.3	0.0	0.3	3.4	0.9	4.8	96.9	D' Herai ash
6	74.0	0.2	14.8	1.8	0.0	0.5	2.9	1.2	4.8	96.7	D' Herai ash
7	73.9	0.7	13.8	2.5	0.3	0.5	2.8	1.2	4.3	97.3	D' Herai ash
8	72.4	0.5	15.0	2.5	0.3	0.5	3.3	1.0	4.5	99.4	D' Herai ash
9	76.2	0.6	12.9	1.9	0.2	0.3	2.4	1.3	4.2	96.8	D' Herai ash
10	72.4	0.6	14.9	2.4	0.2	0.6	3.4	1.1	4.6	99.0	D' Herai ash
11	70.0	0.3	17.4	1.6	0.1	0.3	4.3	0.9	5.3	96.9	D' Herai ash
12	73.3	0.5	14.2	2.6	0.1	0.6	3.1	1.2	4.4	99.5	D' Herai ash
13	78.0	0.5	11.9	1.9	0.2	0.3	1.9	1.4	4.0	96.5	D' Herai ash
14	72.7	0.6	14.6	2.5	0.2	0.6	3.4	1.0	4.4	99.3	D' Herai ash
15	71.7	0.4	15.9	2.0	0.1	0.5	3.7	0.9	4.7	98.8	D' Herai ash
16	72.2	0.5	15.5	1.9	0.2	0.3	3.2	1.3	4.9	95.6	D' Herai ash
17	70.5	0.4	17.1	1.5	0.1	0.2	4.2	1.0	5.1	97.3	D' Herai ash
Ave.	73.4	0.5	14.8	1.9	0.1	0.4	3.2	1.1	4.6	97.5	
SD	2.5	0.2	1.6	0.5	0.1	0.1	0.6	0.2	0.4	1.8	

Sample No. 23	SiO ₂	TiO ₂	Al ₂ O ₃	FeO*	MnO	MgO	CaO	K ₂ O	Na ₂ O	Total**	Comment
1	73.6	0.6	14.0	2.6	0.2	0.8	2.9	1.2	4.2	98.3	Oguni pumice
2	73.3	0.6	14.2	2.5	0.2	0.8	3.0	1.3	4.2	98.3	Oguni pumice
3	73.3	0.7	14.3	2.5	0.2	0.8	2.9	1.1	4.2	98.9	Oguni pumice
4	73.2	0.6	14.3	2.5	0.2	0.8	3.0	1.2	4.2	99.5	Oguni pumice
5	73.6	0.4	14.2	2.5	0.2	0.7	3.0	1.2	4.2	96.5	Oguni pumice
6	73.5	0.5	14.1	2.7	0.2	0.8	3.0	1.2	4.1	98.2	Oguni pumice
7	73.3	0.5	14.1	2.5	0.2	0.8	3.1	1.2	4.4	98.5	Oguni pumice
8	73.4	0.6	14.2	2.6	0.2	0.8	3.0	1.2	4.1	98.3	Oguni pumice
9	73.5	0.4	14.2	2.6	0.2	0.8	3.0	1.1	4.2	98.6	Oguni pumice
10	73.1	0.6	14.1	2.7	0.3	0.8	3.0	1.2	4.1	98.6	Oguni pumice
11	73.2	0.6	14.2	2.7	0.2	0.9	3.0	1.2	4.2	97.5	Oguni pumice
12	73.3	0.5	14.3	2.6	0.1	0.9	3.1	1.2	4.1	98.4	Oguni pumice
13	73.1	0.6	14.2	2.8	0.2	0.9	3.0	1.1	4.2	98.8	Oguni pumice
14	73.4	0.6	14.1	2.5	0.2	0.8	3.0	1.3	4.1	96.7	Oguni pumice
15	73.8	0.5	14.1	2.5	0.2	0.7	3.0	1.1	4.2	97.4	Oguni pumice
16	73.2	0.6	14.2	2.7	0.2	0.8	3.0	1.2	4.1	97.1	Oguni pumice
Ave.	73.3	0.6	14.2	2.6	0.2	0.8	3.0	1.2	4.2	98.1	
SD	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.8	

Sample No. 24	SiO ₂	TiO ₂	Al ₂ O ₃	FeO*	MnO	MgO	CaO	K ₂ O	Na ₂ O	Total**	Comment
1	73.3	0.6	14.1	2.6	0.2	0.8	2.9	1.3	4.2	98.4	Oguni pumice
2	73.9	0.6	14.1	2.5	0.2	0.8	2.8	1.2	4.0	98.7	Oguni pumice
3	73.5	0.6	14.1	2.7	0.2	0.8	2.9	1.1	4.0	98.3	Oguni pumice
4	73.9	0.4	14.5	2.2	0.1	0.6	2.9	1.2	4.4	98.8	Oguni pumice
5	73.8	0.5	14.2	2.6	0.1	0.8	2.9	1.2	3.9	98.3	Oguni pumice
6	73.3	0.5	14.7	2.2	0.2	0.4	3.1	1.2	4.4	97.1	Oguni pumice
7	73.8	0.5	14.1	2.6	0.2	0.8	2.9	1.2	4.0	98.8	Oguni pumice
8	73.7	0.6	14.1	2.5	0.1	0.8	2.9	1.2	4.2	97.2	Oguni pumice
9	73.5	0.5	14.2	2.6	0.2	0.7	3.0	1.2	4.0	99.1	Oguni pumice
10	74.0	0.6	14.0	2.4	0.3	0.7	2.8	1.2	4.0	97.9	Oguni pumice
11	74.0	0.5	14.1	2.5	0.1	0.7	2.7	1.2	4.1	98.7	Oguni pumice
12	73.6	0.5	14.6	2.1	0.1	0.6	3.0	1.1	4.3	99.6	Oguni pumice
13	74.0	0.5	14.1	2.6	0.2	0.8	2.8	1.2	4.0	99.3	Oguni pumice
14	73.5	0.4	14.8	2.3	0.1	0.5	3.2	1.1	4.2	99.2	Oguni pumice
15	74.1	0.5	14.2	2.7	0.1	0.6	2.3	1.6	3.9	98.4	Oguni pumice
16	77.7	0.6	11.6	2.3	0.2	0.8	1.7	1.5	3.8	95.5	Oguni pumice
Ave.	74.0	0.5	14.1	2.5	0.2	0.7	2.8	1.2	4.1	98.3	
SD	1.0	0.1	0.7	0.2	0.1	0.1	0.4	0.1	0.2	1.0	

Sample No. 25	SiO ₂	TiO ₂	Al ₂ O ₃	FeO*	MnO	MgO	CaO	K ₂ O	Na ₂ O	Total**	Comment
1	73.1	0.5	14.0	2.8	0.2	0.8	2.9	1.2	4.5	93.6	Oguni pumice

2	74.0	0.5	14.0	2.7	0.1	0.7	2.7	1.2	4.1	98.7	Oguni pumice
3	73.4	0.6	14.2	2.6	0.2	0.8	2.9	1.1	4.2	98.6	Oguni pumice
4	73.8	0.5	14.1	2.5	0.2	0.8	2.9	1.2	4.0	99.2	Oguni pumice
5	73.5	0.6	14.1	2.6	0.1	0.8	3.0	1.2	4.0	97.4	Oguni pumice
6	73.2	0.6	14.2	2.7	0.2	0.8	3.0	1.2	4.2	96.6	Oguni pumice
7	73.9	0.5	14.1	2.5	0.2	0.8	2.8	1.2	4.0	98.9	Oguni pumice
8	74.3	0.3	14.8	1.9	0.0	0.4	2.9	0.9	4.5	99.0	Oguni pumice
9	73.7	0.5	14.1	2.5	0.2	0.8	2.8	1.2	4.2	98.7	Oguni pumice
10	74.3	0.4	14.2	2.4	0.1	0.7	2.7	1.1	4.0	99.1	Oguni pumice
11	73.6	0.5	14.1	2.6	0.2	0.8	2.9	1.2	4.1	97.9	Oguni pumice
12	73.2	0.6	14.5	2.6	0.2	0.7	3.2	1.2	4.1	99.0	Oguni pumice
13	73.5	0.6	14.0	2.9	0.2	0.9	2.9	1.2	4.1	98.9	Oguni pumice
14	73.8	0.5	14.0	2.6	0.1	0.8	2.8	1.2	4.3	97.9	Oguni pumice
15	74.0	0.5	13.9	2.7	0.1	0.8	2.8	1.1	4.2	98.0	Oguni pumice
16	74.1	0.5	14.1	2.5	0.2	0.5	2.7	1.2	4.1	98.4	Oguni pumice
Ave.	73.7	0.5	14.1	2.6	0.2	0.7	2.9	1.2	4.2	98.1	
SD	0.4	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	1.4	

Sample No. 26	SiO ₂	TiO ₂	Al ₂ O ₃	FeO*	MnO	MgO	CaO	K ₂ O	Na ₂ O	Total**	Comment
1	73.5	0.5	13.9	2.8	0.2	0.8	2.9	1.1	4.2	98.8	To-Nb
2	73.7	0.4	13.8	2.9	0.1	0.9	2.9	1.1	4.3	98.6	To-Nb
3	73.0	0.7	13.8	2.9	0.2	0.8	3.1	1.4	4.2	98.6	To-Nb
4	73.1	0.6	13.8	3.0	0.2	0.8	2.9	1.3	4.3	99.4	To-Nb
5	74.1	0.3	13.8	2.6	0.0	0.8	2.9	1.2	4.2	96.3	To-Nb
6	73.3	0.6	13.8	2.8	0.2	0.8	2.9	1.3	4.3	99.6	To-Nb
7	73.3	0.5	13.8	3.0	0.1	0.7	3.1	1.3	4.1	98.9	To-Nb
8	73.3	0.7	13.7	2.9	0.1	0.8	3.0	1.3	4.3	98.4	To-Nb
9	72.7	0.6	13.8	3.2	0.3	0.8	3.0	1.3	4.2	99.3	To-Nb
10	73.3	0.6	13.8	2.9	0.0	0.8	3.1	1.3	4.2	98.5	To-Nb
11	73.1	0.7	13.8	3.0	0.2	0.8	3.0	1.2	4.3	98.1	To-Nb
12	73.2	0.7	13.8	2.7	0.3	0.8	3.0	1.3	4.3	97.0	To-Nb
13	73.1	0.6	13.7	3.0	0.2	0.9	3.1	1.3	4.2	99.3	To-Nb
14	73.3	0.7	13.8	3.0	0.2	0.8	2.9	1.2	4.2	98.3	To-Nb
15	73.1	0.6	13.7	2.9	0.1	0.8	2.8	1.2	4.8	95.9	To-Nb
16	73.2	0.7	13.8	3.0	0.2	0.8	3.0	1.3	4.1	98.6	To-Nb
Ave.	73.3	0.6	13.8	2.9	0.2	0.8	3.0	1.2	4.3	98.4	
SD	0.3	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.2	1.1	

Sample No. 27	SiO ₂	TiO ₂	Al ₂ O ₃	FeO*	MnO	MgO	CaO	K ₂ O	Na ₂ O	Total**	Comment
1	73.1	0.7	13.7	3.1	0.2	0.9	3.0	1.3	4.1	96.7	To-Nb
2	73.3	0.6	13.8	3.0	0.2	0.8	2.9	1.2	4.2	95.5	To-Nb
3	73.7	0.5	13.8	2.8	0.1	0.9	2.9	1.2	4.2	95.9	To-Nb
4	73.5	0.5	13.7	2.9	0.1	0.8	3.1	1.2	4.2	96.4	To-Nb
5	73.2	0.6	13.9	2.8	0.2	0.8	3.0	1.3	4.2	96.0	To-Nb
6	73.7	0.5	13.8	2.9	0.1	0.8	3.0	1.3	4.1	95.7	To-Nb
7	73.6	0.6	13.6	2.8	0.2	0.8	3.0	1.3	4.2	96.7	To-Nb
8	73.4	0.6	13.8	2.9	0.1	0.8	2.9	1.3	4.2	97.1	To-Nb
9	73.5	0.6	13.8	2.9	0.1	0.8	3.0	1.2	4.1	95.8	To-Nb
10	73.4	0.5	13.8	3.0	0.2	0.8	3.0	1.2	4.2	96.0	To-Nb
11	73.8	0.6	13.8	2.8	0.1	0.8	2.9	1.3	4.0	95.5	To-Nb
12	73.1	0.7	13.6	3.1	0.3	0.8	3.0	1.3	4.1	90.7	To-Nb
13	72.8	0.7	13.8	3.1	0.3	0.8	3.0	1.3	4.2	97.4	To-Nb
14	73.2	0.5	13.7	3.0	0.2	0.9	3.0	1.3	4.3	94.3	To-Nb
15	73.6	0.7	13.6	2.9	0.2	0.7	3.0	1.3	4.1	95.5	To-Nb
16	73.4	0.5	13.9	2.8	0.2	0.8	3.0	1.2	4.1	96.4	To-Nb
17	73.3	0.6	13.7	2.9	0.2	0.8	3.1	1.3	4.1	95.7	To-Nb
Ave.	73.4	0.6	13.7	2.9	0.2	0.8	3.0	1.3	4.2	95.7	
SD	0.2	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.1	1.5	

Sample No. 28	SiO ₂	TiO ₂	Al ₂ O ₃	FeO*	MnO	MgO	CaO	K ₂ O	Na ₂ O	Total**	Comment
1	73.3	0.6	13.7	2.8	0.2	0.8	3.3	1.3	4.1	97.9	To-Nb
2	72.8	0.7	13.9	3.0	0.3	0.8	3.2	1.3	4.0	99.7	To-Nb
3	72.8	0.6	14.0	3.0	0.2	0.9	3.2	1.3	4.1	99.3	To-Nb
4	73.2	0.6	13.9	2.9	0.2	0.8	3.1	1.3	4.0	98.4	To-Nb
5	72.9	0.6	13.8	3.0	0.2	0.9	3.2	1.3	4.1	99.2	To-Nb
6	73.3	0.4	14.1	2.9	0.0	0.8	3.2	1.2	4.1	97.6	To-Nb
7	72.8	0.6	13.9	3.1	0.2	0.9	3.4	1.3	3.8	96.8	To-Nb
8	73.0	0.6	13.9	3.0	0.2	0.9	3.2	1.3	4.1	98.6	To-Nb
9	72.9	0.7	13.8	3.1	0.2	0.8	3.3	1.3	4.0	98.8	To-Nb
10	73.4	0.6	14.1	2.8	0.0	0.7	3.2	1.2	4.1	97.9	To-Nb

11	73.1	0.7	13.9	2.9	0.2	0.9	3.2	1.3	3.9	98.5	To-Nb
12	73.4	0.4	14.0	2.8	0.1	0.9	3.1	1.2	4.2	98.8	To-Nb
13	73.2	0.6	14.0	3.0	0.1	0.8	3.2	1.2	3.9	98.3	To-Nb
14	72.8	0.6	13.8	3.0	0.2	0.8	3.4	1.3	4.1	99.8	To-Nb
15	72.8	0.6	13.9	3.1	0.3	0.9	3.1	1.3	4.0	99.1	To-Nb
16	72.8	0.6	14.0	3.2	0.2	0.9	3.2	1.2	4.0	99.6	To-Nb
Ave.	73.0	0.6	13.9	3.0	0.2	0.8	3.2	1.3	4.0	98.6	
SD	0.2	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.1	0.8	

Sample No. 29	SiO ₂	TiO ₂	Al ₂ O ₃	FeO*	MnO	MgO	CaO	K ₂ O	Na ₂ O	Total**	Comment
1	73.3	0.5	13.9	3.0	0.1	0.8	3.1	1.2	4.1	97.8	To-Nb
2	73.4	0.7	13.8	2.9	0.2	0.8	3.0	1.2	4.0	97.6	To-Nb
3	73.2	0.5	13.7	3.2	0.2	0.8	3.1	1.2	4.1	97.5	To-Nb
4	73.3	0.6	13.9	3.0	0.1	0.8	3.1	1.3	4.0	98.2	To-Nb
5	72.9	0.6	13.7	3.3	0.2	0.9	3.1	1.3	4.0	98.9	To-Nb
6	73.7	0.6	13.7	3.0	0.2	0.8	2.9	1.2	3.9	97.6	To-Nb
7	73.5	0.6	13.7	2.9	0.2	0.7	3.1	1.3	3.9	97.7	To-Nb
8	73.7	0.6	13.6	3.1	0.1	0.7	3.1	1.4	3.8	98.1	To-Nb
9	73.6	0.5	13.8	3.0	0.2	0.8	3.0	1.2	3.9	98.5	To-Nb
10	73.3	0.5	14.0	2.8	0.1	0.8	3.2	1.3	4.1	97.7	To-Nb
11	73.6	0.6	13.7	3.0	0.2	0.9	3.0	1.2	3.9	98.3	To-Nb
12	73.3	0.6	13.9	3.1	0.1	0.8	3.0	1.3	3.9	98.3	To-Nb
13	73.4	0.6	13.9	2.9	0.1	0.8	2.9	1.3	4.0	97.7	To-Nb
14	73.2	0.7	13.7	2.9	0.3	0.8	3.0	1.3	4.1	98.8	To-Nb
15	74.0	0.6	13.5	3.0	0.2	0.8	2.8	1.3	3.8	98.6	To-Nb
16	73.3	0.6	13.9	3.0	0.2	0.9	3.0	1.3	3.9	99.2	To-Nb
Ave.	73.4	0.6	13.8	3.0	0.2	0.8	3.0	1.3	4.0	98.2	
SD	0.3	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.5	

Sample No. 30	SiO ₂	TiO ₂	Al ₂ O ₃	FeO*	MnO	MgO	CaO	K ₂ O	Na ₂ O	Total**	Comment
1	73.5	0.6	13.9	3.0	0.1	0.8	3.1	1.2	3.7	97.4	To-Nb
2	73.2	0.5	14.1	3.0	0.3	0.9	3.0	1.2	3.9	97.5	To-Nb
3	73.3	0.7	13.8	2.8	0.3	0.8	3.1	1.3	4.0	98.6	To-Nb
4	73.0	0.6	13.9	3.0	0.2	0.8	3.2	1.3	4.0	98.3	To-Nb
5	73.4	0.7	13.8	2.8	0.2	0.8	3.0	1.3	4.0	98.9	To-Nb
6	73.9	0.5	13.8	2.9	0.0	0.9	3.0	1.2	3.9	97.6	To-Nb
7	73.0	0.6	13.8	3.3	0.1	0.8	3.0	1.3	4.0	95.0	To-Nb
8	73.4	0.7	14.0	3.0	0.1	0.8	3.0	1.2	3.8	99.3	To-Nb
9	73.3	0.6	13.8	3.0	0.1	0.9	3.1	1.3	4.0	98.6	To-Nb
10	73.0	0.6	13.9	2.9	0.2	0.9	3.0	1.3	4.2	94.2	To-Nb
11	73.2	0.5	13.9	3.0	0.1	0.9	3.1	1.3	4.1	98.6	To-Nb
12	73.6	0.5	13.8	2.9	0.2	0.8	3.0	1.2	3.9	94.9	To-Nb
13	73.0	0.6	13.9	3.0	0.1	0.8	3.2	1.3	4.0	98.4	To-Nb
14	73.3	0.5	14.0	3.0	0.1	0.9	3.0	1.3	4.0	98.0	To-Nb
15	73.0	0.7	13.8	2.9	0.2	0.9	3.1	1.3	4.2	93.8	To-Nb
16	73.7	0.5	13.7	3.0	0.1	0.8	3.1	1.2	3.9	98.7	To-Nb
Ave.	73.3	0.6	13.9	3.0	0.2	0.8	3.1	1.2	4.0	97.4	
SD	0.3	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	1.8	

Sample No. 31	SiO ₂	TiO ₂	Al ₂ O ₃	FeO*	MnO	MgO	CaO	K ₂ O	Na ₂ O	Total**	Comment
1	73.4	0.5	13.9	2.9	0.2	0.9	3.0	1.2	4.0	98.5	To-Nb
2	72.9	0.6	13.8	3.1	0.2	0.9	3.3	1.2	3.9	98.9	To-Nb
3	73.0	0.6	13.8	3.0	0.1	0.8	3.2	1.3	4.1	98.3	To-Nb
4	72.7	0.6	14.3	2.9	0.1	0.7	3.4	1.2	4.2	98.7	To-Nb
5	72.8	0.6	13.9	3.1	0.2	0.8	3.3	1.3	4.0	98.6	To-Nb
6	73.1	0.6	13.9	2.9	0.3	0.8	3.3	1.3	3.9	99.0	To-Nb
7	73.1	0.6	13.9	3.0	0.2	0.9	3.1	1.3	4.1	98.6	To-Nb
8	72.7	0.8	13.9	3.1	0.3	0.8	3.2	1.2	4.1	99.2	To-Nb
9	73.0	0.6	13.8	3.1	0.1	0.9	3.2	1.2	4.1	98.7	To-Nb
10	73.3	0.5	13.8	3.1	0.1	0.8	3.1	1.3	4.1	98.1	To-Nb
11	73.3	0.6	14.0	3.0	0.2	0.8	3.0	1.2	3.9	97.9	To-Nb
12	73.1	0.6	13.9	3.1	0.1	0.8	3.2	1.2	4.0	99.0	To-Nb
13	72.9	0.6	13.9	3.2	0.1	0.8	3.2	1.2	4.1	98.5	To-Nb
14	72.7	0.7	13.9	3.2	0.2	0.8	3.1	1.3	4.0	98.8	To-Nb
15	72.9	0.7	13.8	3.1	0.2	0.8	3.1	1.3	4.1	99.5	To-Nb
16	72.9	0.6	13.8	3.2	0.2	0.9	3.1	1.2	4.0	99.4	To-Nb
Ave.	73.0	0.6	13.9	3.1	0.2	0.8	3.2	1.2	4.0	98.7	
SD	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.4	

Sample No. 32	SiO ₂	TiO ₂	Al ₂ O ₃	FeO*	MnO	MgO	CaO	K ₂ O	Na ₂ O	Total**	Comment
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1	76.8	0.5	12.8	1.6	0.2	0.5	2.0	1.4	4.2	96.5	To-H
2	77.0	0.3	13.1	1.8	0.1	0.5	2.1	1.1	4.0	95.2	To-H
3	76.6	0.4	13.0	1.8	0.2	0.6	2.1	1.3	4.1	95.4	To-H
4	77.1	0.4	12.9	1.8	0.1	0.6	2.1	1.3	3.8	94.7	To-H
5	77.6	0.2	12.7	1.8	0.0	0.4	1.9	1.2	4.2	97.1	To-H
6	77.6	0.3	12.9	1.6	0.1	0.4	2.0	1.3	4.0	98.1	To-H
7	77.7	0.2	12.8	1.7	0.2	0.5	2.0	1.2	3.8	92.7	To-H
8	75.6	0.4	13.6	2.0	0.1	0.6	2.3	1.2	4.2	96.7	To-H
9	77.6	0.3	12.7	1.7	0.1	0.4	1.8	1.3	4.0	94.1	To-H
10	77.7	0.3	12.8	1.5	0.1	0.4	1.9	1.2	4.2	94.1	To-H
11	77.9	0.3	12.9	1.5	0.1	0.4	1.9	1.3	3.8	93.3	To-H
12	76.5	0.4	13.0	1.7	0.2	0.5	2.2	1.3	4.2	95.9	To-H
13	77.3	0.3	12.9	1.6	0.1	0.4	2.0	1.2	4.3	96.0	To-H
14	76.6	0.4	13.1	1.7	0.1	0.5	2.1	1.2	4.2	96.1	To-H
15	77.2	0.3	12.8	1.7	0.1	0.5	1.9	1.3	4.3	95.5	To-H
16	75.9	0.4	13.3	2.0	0.1	0.6	2.3	1.2	4.1	97.0	To-H
17	78.1	0.1	12.9	1.4	0.0	0.4	1.8	1.1	4.2	96.4	To-H
18	76.6	0.4	13.0	1.8	0.2	0.6	2.2	1.2	4.0	93.8	To-H
19	77.8	0.2	12.9	1.5	0.0	0.5	2.0	1.1	4.0	94.9	To-H
20	77.0	0.4	13.0	1.8	0.2	0.5	2.0	1.3	3.9	93.2	To-H
Ave.	77.1	0.3	13.0	1.7	0.1	0.5	2.0	1.2	4.1	95.3	
SD	0.7	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.2	1.5	

Sample No. 33	SiO ₂	TiO ₂	Al ₂ O ₃	FeO*	MnO	MgO	CaO	K ₂ O	Na ₂ O	Total**	Comment
1	74.2	0.5	14.0	2.3	0.2	0.7	2.8	1.2	4.1	96.9	To-HP
2	74.8	0.5	13.6	2.3	0.2	0.7	2.6	1.2	4.0	97.6	To-HP
3	76.7	0.2	13.3	1.9	0.1	0.6	2.1	1.2	4.1	96.5	To-HP
4	73.7	0.5	14.0	2.5	0.3	0.8	2.7	1.2	4.3	95.9	To-HP
5	77.1	0.1	13.3	1.6	0.0	0.5	2.1	1.2	4.2	97.2	To-HP
6	78.7	0.5	12.0	1.4	0.1	0.4	1.8	1.3	3.9	95.1	To-HP
7	76.8	0.3	13.1	1.7	0.0	0.5	2.1	1.2	4.2	95.1	To-HP
8	76.0	0.3	13.6	2.0	0.1	0.6	2.3	1.2	3.9	92.5	To-HP
9	78.1	0.4	12.0	1.6	0.2	0.5	1.9	1.3	4.0	94.8	To-HP
10	77.6	0.3	12.8	1.6	0.2	0.4	1.8	1.3	4.1	97.9	To-HP
11	77.3	0.2	13.2	1.6	0.0	0.5	1.9	1.1	4.2	94.4	To-HP
12	78.3	0.4	12.3	1.5	0.1	0.5	1.7	1.3	3.9	93.9	To-HP
13	75.4	0.4	13.5	2.0	0.1	0.7	2.5	1.2	4.2	96.4	To-HP
14	78.5	0.2	12.4	1.5	0.0	0.4	1.8	1.2	3.9	94.0	To-HP
15	73.7	0.6	14.0	2.4	0.3	0.8	2.9	1.1	4.3	94.9	To-HP
16	78.0	0.3	12.4	1.7	0.1	0.5	1.8	1.2	3.9	94.2	To-HP
17	75.1	0.3	14.0	2.1	0.0	0.7	2.5	1.1	4.2	96.1	To-HP
18	75.7	0.5	13.3	2.1	0.2	0.7	2.5	1.2	4.1	94.1	To-HP
Ave.	76.4	0.4	13.2	1.9	0.1	0.6	2.2	1.2	4.1	95.4	
SD	1.7	0.1	0.7	0.3	0.1	0.1	0.4	0.1	0.1	1.5	

Sample No. 34	SiO ₂	TiO ₂	Al ₂ O ₃	FeO*	MnO	MgO	CaO	K ₂ O	Na ₂ O	Total**	Comment
1	73.7	0.7	14.0	2.6	0.2	0.7	2.9	1.1	4.1	97.4	To-HP
2	74.8	0.6	13.6	2.2	0.3	0.7	2.6	1.2	4.1	97.5	To-HP
3	77.9	0.2	12.7	1.6	0.1	0.4	1.9	1.1	4.0	97.3	To-HP
4	75.2	0.4	13.7	2.1	0.2	0.6	2.3	1.3	4.3	97.1	To-HP
5	77.3	0.4	12.7	1.7	0.2	0.4	1.9	1.2	4.2	96.1	To-HP
6	75.3	0.5	13.5	2.0	0.2	0.6	2.3	1.3	4.3	95.9	To-HP
7	77.3	0.3	12.8	1.7	0.2	0.5	2.0	1.3	4.0	95.5	To-HP
8	75.8	0.6	12.5	2.5	0.3	0.8	2.4	1.1	4.1	96.5	To-HP
9	76.8	0.3	13.2	1.8	0.0	0.5	2.1	1.2	4.2	96.9	To-HP
10	75.5	0.5	13.4	2.1	0.1	0.7	2.4	1.3	4.1	98.1	To-HP
11	75.6	0.4	13.6	1.9	0.1	0.5	2.4	1.2	4.4	95.0	To-HP
12	73.8	0.5	14.1	2.5	0.2	0.7	2.9	1.1	4.1	97.3	To-HP
13	76.9	0.2	13.2	1.7	0.0	0.5	2.1	1.1	4.2	97.1	To-HP
14	75.8	0.4	13.6	1.9	0.1	0.6	2.3	1.2	4.1	93.9	To-HP
15	74.1	0.5	14.0	2.5	0.1	0.8	2.8	1.1	4.2	97.2	To-HP
16	75.6	0.5	13.3	1.9	0.3	0.6	2.4	1.3	4.2	95.4	To-HP
17	74.0	0.5	13.8	2.3	0.3	0.7	2.9	1.2	4.2	98.3	To-HP
18	75.7	0.4	13.4	1.9	0.1	0.6	2.3	1.3	4.3	96.0	To-HP
Ave.	75.6	0.4	13.4	2.0	0.2	0.6	2.4	1.2	4.2	96.6	
SD	1.3	0.1	0.5	0.3	0.1	0.1	0.3	0.1	0.1	1.1	

Sample No. 35	SiO ₂	TiO ₂	Al ₂ O ₃	FeO*	MnO	MgO	CaO	K ₂ O	Na ₂ O	Total**	Comment
1	73.4	0.6	14.1	2.7	0.2	0.8	3.0	1.1	4.2	98.1	To-HP
2	75.3	0.5	13.6	2.0	0.2	0.6	2.4	1.2	4.3	98.7	To-HP

3	73.9	0.4	14.1	2.5	0.0	0.8	2.9	1.1	4.3	99.0	To-HP
4	73.0	0.6	14.3	2.5	0.2	0.9	3.1	1.0	4.3	98.0	To-HP
5	75.6	0.3	13.7	2.0	0.1	0.6	2.5	1.1	4.1	98.5	To-HP
6	73.8	0.6	14.1	2.5	0.1	0.8	2.9	1.0	4.3	97.7	To-HP
7	73.8	0.4	14.0	2.5	0.2	0.8	3.0	1.1	4.2	98.4	To-HP
8	76.6	0.2	13.3	1.7	0.1	0.6	2.1	1.1	4.2	97.4	To-HP
9	73.5	0.5	14.1	2.6	0.2	0.8	3.0	1.0	4.3	98.3	To-HP
10	73.4	0.6	14.1	2.6	0.2	0.8	3.0	1.2	4.2	96.7	To-HP
11	73.9	0.5	14.1	2.4	0.2	0.8	2.9	1.1	4.3	98.1	To-HP
12	73.0	0.5	14.2	2.7	0.3	0.8	3.2	1.1	4.3	98.3	To-HP
13	73.4	0.6	14.1	2.6	0.2	0.8	2.9	1.1	4.3	98.6	To-HP
14	73.9	0.5	14.1	2.4	0.0	0.8	3.0	1.2	4.2	97.8	To-HP
15	73.5	0.6	14.2	2.5	0.2	0.8	2.9	1.1	4.2	96.9	To-HP
16	72.8	0.7	14.3	2.5	0.2	0.9	3.1	1.2	4.3	98.8	To-HP
17	73.7	0.5	14.2	2.5	0.1	0.9	2.9	1.0	4.3	97.9	To-HP
18	73.4	0.6	14.1	2.5	0.2	0.8	3.0	1.1	4.3	98.3	To-HP
Ave.	73.9	0.5	14.0	2.4	0.1	0.8	2.9	1.1	4.2	98.1	
SD	1.0	0.1	0.3	0.3	0.1	0.1	0.3	0.1	0.1	0.6	

Sample No. 36	SiO ₂	TiO ₂	Al ₂ O ₃	FeO*	MnO	MgO	CaO	K ₂ O	Na ₂ O	Total**	Comment
1	75.5	0.3	13.7	2.0	0.2	0.7	2.4	1.2	4.1	96.7	To-HP
2	76.4	0.3	13.5	2.0	0.1	0.6	2.3	1.0	3.8	92.5	To-HP
3	78.5	0.3	12.3	1.4	0.1	0.4	1.6	1.4	4.0	95.0	To-HP
4	75.7	0.3	13.8	2.0	0.0	0.6	2.4	1.1	4.1	96.0	To-HP
5	73.3	0.5	14.2	2.6	0.3	0.8	3.0	1.1	4.2	96.9	To-HP
6	77.3	0.3	12.7	1.6	0.3	0.5	2.0	1.3	4.2	95.6	To-HP
7	76.8	0.4	12.9	1.7	0.2	0.5	2.1	1.4	4.1	98.4	To-HP
8	77.7	0.2	12.9	1.5	0.1	0.4	1.9	1.2	4.1	96.7	To-HP
9	73.4	0.6	14.2	2.5	0.2	0.8	3.0	1.1	4.2	97.8	To-HP
10	74.5	0.3	14.1	2.2	0.0	0.8	2.7	1.1	4.3	95.4	To-HP
11	73.5	0.6	14.1	2.7	0.2	0.8	3.1	1.1	4.0	96.7	To-HP
12	75.1	0.3	13.8	2.3	0.1	0.7	2.6	1.1	4.2	97.2	To-HP
13	72.7	0.6	14.5	2.7	0.2	0.9	3.2	1.0	4.2	97.9	To-HP
14	73.7	0.6	14.0	2.5	0.2	0.7	3.0	1.2	4.1	98.2	To-HP
15	73.3	0.5	14.3	2.7	0.2	0.9	3.0	1.0	4.2	98.1	To-HP
16	74.8	0.5	13.6	2.2	0.1	0.6	2.7	1.2	4.2	97.2	To-HP
17	78.1	0.2	12.6	1.6	0.1	0.4	1.7	1.2	4.0	94.0	To-HP
18	73.4	0.5	14.2	2.7	0.2	0.8	3.0	1.1	4.1	98.2	To-HP
Ave.	75.2	0.4	13.6	2.2	0.1	0.7	2.5	1.2	4.1	96.6	
SD	1.9	0.2	0.7	0.5	0.1	0.2	0.5	0.1	0.1	1.6	

Sample No. 37	SiO ₂	TiO ₂	Al ₂ O ₃	FeO*	MnO	MgO	CaO	K ₂ O	Na ₂ O	Total**	Comment
1	76.6	0.3	13.1	1.7	0.1	0.6	2.2	1.2	4.2	94.9	To-HP
2	76.7	0.5	13.0	1.7	0.1	0.5	2.2	1.2	4.1	97.6	To-HP
3	76.9	0.3	13.3	1.8	0.1	0.4	2.0	1.2	4.2	95.9	To-HP
4	77.8	0.3	12.8	1.5	0.1	0.4	2.0	1.3	3.9	92.6	To-HP
5	76.3	0.4	13.2	1.8	0.1	0.5	2.3	1.2	4.2	97.9	To-HP
6	76.3	0.3	13.2	1.8	0.2	0.6	2.2	1.2	4.2	97.1	To-HP
7	75.6	0.2	13.6	2.1	0.1	0.6	2.5	1.1	4.2	95.4	To-HP
8	76.4	0.2	13.4	1.9	0.0	0.6	2.2	1.1	4.1	93.8	To-HP
9	75.6	0.2	13.7	1.8	0.1	0.6	2.5	1.1	4.4	97.0	To-HP
10	74.9	0.5	13.8	2.1	0.2	0.7	2.6	1.2	4.1	97.8	To-HP
11	75.5	0.4	13.5	1.9	0.2	0.6	2.6	1.2	4.2	98.5	To-HP
12	76.0	0.4	13.7	2.2	0.2	0.6	2.5	1.2	3.2	97.1	To-HP
13	75.2	0.5	13.4	2.4	0.2	0.7	2.5	1.1	4.1	98.3	To-HP
14	76.5	0.4	13.2	1.8	0.1	0.5	2.3	1.2	4.1	97.8	To-HP
15	75.7	0.3	13.7	2.0	0.1	0.7	2.3	1.2	4.2	97.4	To-HP
16	76.5	0.4	13.0	1.7	0.2	0.6	2.1	1.2	4.3	96.2	To-HP
17	77.7	0.3	12.6	1.4	0.1	0.4	1.8	1.3	4.2	98.2	To-HP
18	76.9	0.4	12.9	1.6	0.2	0.5	1.9	1.3	4.2	96.3	To-HP
Ave.	76.3	0.4	13.3	1.8	0.1	0.6	2.3	1.2	4.1	96.6	
SD	0.8	0.1	0.3	0.2	0.1	0.1	0.2	0.1	0.2	1.6	

Sample No. 38	SiO ₂	TiO ₂	Al ₂ O ₃	FeO*	MnO	MgO	CaO	K ₂ O	Na ₂ O	Total**	Comment
1	78.2	0.2	12.8	1.6	0.0	0.5	1.8	1.2	3.9	92.6	To-HP
2	74.9	0.6	13.5	2.3	0.3	0.6	2.6	1.3	4.0	97.2	To-HP
3	75.6	0.3	13.7	2.0	0.1	0.7	2.4	1.1	4.2	97.1	To-HP
4	75.0	0.5	13.5	2.2	0.2	0.7	2.6	1.2	4.1	97.8	To-HP
5	74.6	0.5	13.8	2.2	0.1	0.8	2.8	1.1	4.1	97.8	To-HP
6	75.9	0.2	13.8	1.9	0.1	0.7	2.4	1.1	4.1	97.4	To-HP

7	74.0	0.6	13.9	2.5	0.2	0.8	2.7	1.1	4.2	98.3	To-HP
8	75.3	0.4	13.5	2.2	0.2	0.6	2.5	1.2	4.1	96.9	To-HP
9	77.1	0.2	13.2	1.7	0.0	0.6	2.0	1.1	4.2	93.7	To-HP
10	77.2	0.3	12.7	1.8	0.1	0.5	2.0	1.3	4.1	94.7	To-HP
11	78.8	0.1	12.7	1.1	0.0	0.4	1.8	1.1	4.0	95.2	To-HP
12	75.1	0.4	13.7	2.2	0.2	0.7	2.6	1.1	4.2	96.3	To-HP
13	76.0	0.2	13.6	1.9	0.1	0.6	2.5	1.1	4.1	95.9	To-HP
14	75.4	0.4	13.5	2.1	0.2	0.7	2.5	1.1	4.1	97.1	To-HP
15	76.3	0.4	13.2	1.8	0.3	0.6	2.2	1.3	3.9	94.3	To-HP
16	75.2	0.5	13.7	2.1	0.2	0.7	2.6	1.1	4.0	98.0	To-HP
17	75.7	0.3	13.7	1.9	0.1	0.7	2.3	1.1	4.2	93.9	To-HP
18	77.6	0.3	13.1	1.5	0.1	0.4	1.9	1.2	4.0	93.2	To-HP
Ave.	76.0	0.3	13.4	1.9	0.1	0.6	2.3	1.2	4.1	95.9	
SD	1.3	0.2	0.4	0.3	0.1	0.1	0.3	0.1	0.1	1.8	

Sample No. 39	SiO ₂	TiO ₂	Al ₂ O ₃	FeO*	MnO	MgO	CaO	K ₂ O	Na ₂ O	Total**	Comment
1	75.6	0.3	13.7	2.0	0.1	0.6	2.5	1.2	4.1	97.3	To-HP
2	76.3	0.5	13.0	2.0	0.1	0.7	2.3	1.2	3.9	97.6	To-HP
3	75.1	0.4	13.6	2.3	0.2	0.6	2.6	1.2	4.0	97.1	To-HP
4	75.6	0.5	13.3	2.2	0.2	0.6	2.4	1.2	4.1	98.1	To-HP
5	75.1	0.5	13.6	2.1	0.1	0.6	2.6	1.2	4.2	96.2	To-HP
6	76.6	0.3	13.3	1.8	0.1	0.5	2.1	1.2	4.2	95.3	To-HP
7	74.8	0.5	13.7	2.2	0.2	0.7	2.7	1.2	4.1	98.6	To-HP
8	79.1	0.3	11.9	1.5	0.1	0.3	1.4	1.6	3.9	93.0	To-HP
9	76.4	0.4	13.1	2.0	0.1	0.5	2.1	1.2	4.2	95.9	To-HP
10	75.6	0.4	13.7	1.9	0.1	0.6	2.5	1.2	4.0	97.6	To-HP
11	76.7	0.3	13.0	2.0	0.1	0.6	2.1	1.1	4.1	98.2	To-HP
12	74.0	0.5	14.0	2.6	0.2	0.8	2.8	1.1	4.0	98.9	To-HP
13	76.1	0.4	13.2	2.1	0.1	0.6	2.3	1.1	4.1	96.7	To-HP
14	73.1	0.6	14.4	2.6	0.3	0.9	3.1	1.1	4.1	97.9	To-HP
15	74.5	0.5	13.9	2.3	0.2	0.7	2.6	1.2	4.2	98.6	To-HP
16	75.8	0.4	13.3	2.1	0.2	0.6	2.3	1.2	4.1	94.5	To-HP
17	74.1	0.6	13.8	2.4	0.3	0.6	2.9	1.1	4.1	98.6	To-HP
18	73.8	0.5	14.1	2.5	0.2	0.8	2.7	1.2	4.3	98.7	To-HP
Ave.	75.5	0.4	13.5	2.1	0.2	0.6	2.4	1.2	4.1	97.1	
SD	1.4	0.1	0.6	0.3	0.1	0.1	0.4	0.1	0.1	1.6	

Sample No. 40	SiO ₂	TiO ₂	Al ₂ O ₃	FeO*	MnO	MgO	CaO	K ₂ O	Na ₂ O	Total**	Comment
1	77.3	0.4	12.9	1.8	0.1	0.5	1.8	1.2	4.0	93.9	To-BP2
2	75.2	0.5	13.6	2.1	0.2	0.6	2.4	1.3	4.3	94.1	To-BP2
3	73.6	0.6	14.3	2.4	0.2	0.8	3.0	1.3	4.0	98.2	To-BP2
4	78.5	0.3	12.3	1.6	0.1	0.4	1.5	1.3	3.9	93.6	To-BP2
5	77.6	0.2	12.6	1.4	0.3	0.1	0.6	2.6	4.6	96.4	To-BP2
6	77.7	0.3	13.0	1.6	0.1	0.4	1.8	1.3	3.9	93.3	To-BP2
7	79.1	0.2	12.2	1.5	0.0	0.5	1.4	1.4	3.8	92.5	To-BP2
8	78.0	0.3	12.5	1.8	0.2	0.5	1.5	1.3	4.0	93.2	To-BP2
9	77.5	0.4	12.5	1.8	0.3	0.5	1.7	1.4	4.0	94.1	To-BP2
10	78.2	0.2	12.9	1.6	0.0	0.4	1.7	1.3	3.7	92.1	To-BP2
11	78.4	0.4	12.3	1.7	0.1	0.4	1.6	1.4	3.7	92.3	To-BP2
12	78.3	0.3	12.4	1.6	0.1	0.5	1.4	1.4	4.0	93.6	To-BP2
13	75.0	0.4	13.8	2.1	0.2	0.7	2.4	1.2	4.3	97.5	To-BP2
14	74.1	0.6	13.9	2.4	0.3	0.7	2.7	1.2	4.2	94.9	To-BP2
15	78.1	0.3	11.9	1.6	0.1	0.4	1.5	3.9	2.1	92.3	To-BP2
16	78.3	0.5	12.0	1.7	0.2	0.4	1.7	1.5	3.8	94.1	To-BP2
17	78.9	0.2	12.4	1.5	0.1	0.4	1.4	1.3	3.8	92.6	To-BP2
18	75.6	0.3	13.7	1.9	0.1	0.6	2.3	1.2	4.3	98.0	To-BP2
Ave.	77.2	0.4	12.8	1.8	0.1	0.5	1.8	1.5	3.9	94.3	
SD	1.7	0.1	0.7	0.3	0.1	0.1	0.6	0.7	0.5	2.0	

Sample No. 41	SiO ₂	TiO ₂	Al ₂ O ₃	FeO*	MnO	MgO	CaO	K ₂ O	Na ₂ O	Total**	Comment
1	75.2	0.4	13.7	2.0	0.1	0.7	2.3	1.2	4.4	96.2	To-BP2
2	75.8	0.5	13.3	1.9	0.2	0.6	2.2	1.4	4.2	94.8	To-BP2
3	75.9	0.2	13.7	1.9	0.1	0.6	2.3	1.1	4.1	98.1	To-BP2
4	77.2	0.4	12.9	1.9	0.1	0.5	1.8	1.4	4.0	93.6	To-BP2
5	75.0	0.5	13.6	1.9	0.2	0.6	2.5	1.3	4.4	97.9	To-BP2
6	76.9	0.3	13.1	1.9	0.1	0.4	1.9	1.3	4.1	94.0	To-BP2
7	76.0	0.4	13.6	1.8	0.2	0.6	2.2	1.4	3.8	93.8	To-BP2
8	73.0	0.6	14.5	2.6	0.2	0.9	2.9	1.2	4.2	95.9	To-BP2
9	75.3	0.4	13.5	2.0	0.2	0.6	2.3	1.3	4.4	96.4	To-BP2
10	75.4	0.5	13.7	2.0	0.2	0.6	2.3	1.3	4.2	97.1	To-BP2

11	75.9	0.3	13.6	1.9	0.1	0.6	2.3	1.3	4.0	92.8	To-BP2
12	75.4	0.4	13.7	1.9	0.2	0.6	2.3	1.3	4.3	94.5	To-BP2
13	75.6	0.3	13.7	1.8	0.1	0.6	2.3	1.3	4.3	98.1	To-BP2
14	76.1	0.3	13.6	1.8	0.0	0.6	2.2	1.1	4.2	93.1	To-BP2
15	74.6	0.5	13.8	2.2	0.2	0.6	2.6	1.3	4.4	99.0	To-BP2
16	75.9	0.3	13.6	1.8	0.1	0.6	2.3	1.1	4.3	97.4	To-BP2
17	75.3	0.4	13.7	2.1	0.3	0.6	2.3	1.3	4.2	96.2	To-BP2
Ave.	75.6	0.4	13.6	2.0	0.1	0.6	2.3	1.3	4.2	95.8	
SD	0.9	0.1	0.3	0.2	0.1	0.1	0.2	0.1	0.2	2.0	

Sample No. 42	SiO ₂	TiO ₂	Al ₂ O ₃	FeO*	MnO	MgO	CaO	K ₂ O	Na ₂ O	Total**	Comment
1	75.6	0.3	13.7	2.1	0.2	0.7	2.4	1.2	4.1	97.5	To-BP2
2	75.3	0.4	13.6	2.1	0.1	0.6	2.3	1.3	4.2	95.0	To-BP2
3	75.1	0.4	13.6	2.1	0.2	0.6	2.5	1.3	4.3	97.0	To-BP2
4	75.7	0.5	13.4	2.1	0.1	0.5	2.3	1.3	4.2	96.6	To-BP2
5	76.1	0.2	13.6	2.0	0.1	0.7	2.2	1.1	4.0	93.0	To-BP2
6	75.5	0.4	13.6	1.8	0.2	0.6	2.3	1.3	4.3	95.4	To-BP2
7	75.2	0.4	13.8	2.1	0.0	0.7	2.5	1.1	4.4	96.7	To-BP2
8	75.4	0.5	13.7	2.0	0.3	0.6	2.3	1.3	4.1	94.0	To-BP2
9	75.5	0.5	13.6	1.9	0.2	0.7	2.3	1.3	4.2	94.5	To-BP2
10	76.3	0.3	13.6	1.7	0.0	0.5	2.3	1.2	4.1	92.8	To-BP2
11	74.5	0.4	14.0	2.5	0.2	0.6	2.7	1.2	4.1	96.8	To-BP2
12	75.7	0.4	13.5	2.0	0.2	0.6	2.4	1.2	4.2	96.9	To-BP2
13	75.2	0.5	13.6	2.0	0.3	0.6	2.5	1.2	4.1	93.9	To-BP2
14	75.7	0.3	13.7	1.9	0.1	0.7	2.3	1.1	4.3	93.1	To-BP2
15	75.8	0.3	13.6	1.9	0.1	0.6	2.3	1.2	4.4	96.4	To-BP2
16	75.5	0.4	13.5	1.9	0.2	0.6	2.4	1.3	4.2	98.2	To-BP2
17	75.5	0.4	13.7	1.9	0.2	0.6	2.3	1.3	4.1	97.0	To-BP2
18	75.6	0.5	13.5	2.0	0.1	0.6	2.4	1.2	4.2	94.3	To-BP2
Ave.	75.5	0.4	13.6	2.0	0.1	0.6	2.4	1.2	4.2	95.5	
SD	0.4	0.1	0.1	0.2	0.1	0.0	0.1	0.1	0.1	1.7	

Sample No. 43	SiO ₂	TiO ₂	Al ₂ O ₃	FeO*	MnO	MgO	CaO	K ₂ O	Na ₂ O	Total**	Comment
1	77.7	0.2	12.7	1.8	0.0	0.5	1.8	1.1	4.2	96.6	To-Of
2	77.6	0.3	12.5	1.9	0.1	0.5	2.0	1.1	4.0	93.8	To-Of
3	75.2	0.5	13.5	2.3	0.2	0.7	2.6	1.1	4.0	93.2	To-Of
4	76.6	0.4	12.9	2.0	0.2	0.5	2.1	1.3	4.0	95.6	To-Of
5	76.4	0.3	13.3	2.0	0.1	0.6	2.2	1.2	4.0	97.1	To-Of
6	77.4	0.4	13.0	1.7	0.0	0.4	2.0	1.3	3.9	93.0	To-Of
7	76.5	0.4	13.0	2.1	0.2	0.6	2.2	1.2	3.8	92.4	To-Of
8	77.3	0.4	12.7	1.7	0.2	0.5	2.0	1.2	4.0	93.9	To-Of
9	77.6	0.2	13.0	1.6	0.1	0.5	2.0	1.1	4.0	95.5	To-Of
10	75.2	0.4	13.7	2.2	0.1	0.7	2.6	1.1	4.1	93.3	To-Of
11	75.2	0.5	13.5	2.2	0.2	0.6	2.4	1.2	4.1	94.3	To-Of
12	76.1	0.4	13.1	2.3	0.2	0.6	2.3	1.2	3.9	93.1	To-Of
13	76.4	0.3	13.1	2.1	0.0	0.6	2.2	1.2	4.1	95.4	To-Of
14	77.7	0.2	12.9	1.7	0.1	0.5	1.9	1.1	3.9	92.6	To-Of
15	77.5	0.3	12.7	1.7	0.1	0.5	2.0	1.2	4.2	94.3	To-Of
16	76.1	0.4	13.4	1.9	0.2	0.5	2.3	1.1	4.1	94.4	To-Of
17	77.5	0.3	12.9	1.7	0.1	0.5	1.9	1.1	4.0	93.0	To-Of
18	75.6	0.3	13.6	2.3	0.1	0.7	2.4	1.1	4.1	94.1	To-Of
Ave.	76.6	0.4	13.1	2.0	0.1	0.5	2.2	1.2	4.0	94.2	
SD	0.9	0.1	0.3	0.2	0.1	0.1	0.2	0.1	0.1	1.4	

Sample No. 44	SiO ₂	TiO ₂	Al ₂ O ₃	FeO*	MnO	MgO	CaO	K ₂ O	Na ₂ O	Total**	Comment
1	74.1	0.3	14.2	2.4	0.1	0.8	2.8	0.9	4.3	95.9	To-G
2	73.5	0.4	14.3	2.6	0.1	0.8	3.0	1.0	4.4	98.1	To-G
3	73.5	0.5	14.1	2.6	0.3	0.9	2.8	1.1	4.3	98.2	To-G
4	73.4	0.6	14.3	2.7	0.2	0.8	2.8	1.0	4.2	97.9	To-G
5	73.5	0.6	14.1	2.6	0.2	0.8	2.8	1.1	4.4	96.7	To-G
6	73.6	0.5	14.2	2.6	0.2	0.8	2.9	1.0	4.3	97.9	To-G
7	73.7	0.6	14.4	2.4	0.2	0.8	2.8	1.1	4.1	93.5	To-G
8	73.2	0.5	14.3	2.5	0.3	0.8	3.0	1.1	4.4	98.4	To-G
9	73.3	0.6	14.2	2.6	0.2	0.7	2.9	1.0	4.6	97.5	To-G
10	73.3	0.5	14.4	2.6	0.2	0.8	3.0	1.0	4.3	97.7	To-G
11	73.2	0.5	14.4	2.6	0.2	0.8	2.9	1.1	4.2	97.4	To-G
12	72.6	0.6	14.4	2.9	0.1	0.9	3.1	1.1	4.3	98.7	To-G
13	72.6	0.6	14.3	3.0	0.3	1.0	2.9	1.1	4.3	98.8	To-G
14	74.1	0.6	13.5	2.6	0.2	0.8	2.7	1.1	4.3	97.0	To-G
15	73.3	0.6	14.3	2.5	0.3	0.8	2.8	1.1	4.3	98.4	To-G

16	73.5	0.4	14.3	2.5	0.2	0.8	2.9	1.0	4.4	98.1	To-G
17	73.4	0.6	14.3	2.5	0.2	0.8	2.8	1.1	4.3	97.6	To-G
18	73.7	0.3	14.4	2.4	0.0	0.9	2.9	1.0	4.5	97.2	To-G
Ave.	73.4	0.5	14.2	2.6	0.2	0.8	2.9	1.0	4.3	97.5	
SD	0.4	0.1	0.2	0.1	0.1	0.0	0.1	0.1	0.1	1.2	

Sample No. 45	SiO ₂	TiO ₂	Al ₂ O ₃	FeO*	MnO	MgO	CaO	K ₂ O	Na ₂ O	Total**	Comment
1	73.7	0.6	14.2	2.4	0.0	0.8	2.9	1.1	4.3	96.6	To-G
2	73.7	0.5	14.2	2.5	0.2	0.9	2.9	1.0	4.2	92.7	To-G
3	71.7	0.7	14.5	3.2	0.3	1.1	3.4	1.0	4.3	96.1	To-G
4	72.6	0.6	14.5	2.8	0.3	0.9	3.0	1.1	4.3	97.9	To-G
5	73.5	0.6	14.3	2.6	0.2	0.9	2.8	1.0	4.3	95.7	To-G
6	73.7	0.6	14.1	2.5	0.2	0.8	2.9	1.2	4.2	93.8	To-G
7	71.4	0.7	14.5	3.4	0.1	1.0	3.5	1.0	4.3	96.9	To-G
8	71.4	0.6	14.8	3.5	0.2	1.1	3.5	1.0	4.1	97.9	To-G
9	73.7	0.5	14.3	2.7	0.2	0.7	2.7	1.1	4.1	97.3	To-G
10	73.6	0.5	14.2	2.4	0.2	0.9	3.0	1.1	4.2	93.8	To-G
11	73.7	0.5	14.2	2.6	0.2	0.8	3.0	1.1	3.9	92.4	To-G
12	73.7	0.5	14.3	2.5	0.2	0.8	2.8	1.0	4.2	93.9	To-G
13	73.3	0.6	14.3	2.6	0.2	0.8	2.9	1.0	4.3	97.1	To-G
14	73.9	0.4	14.4	2.4	0.1	0.8	2.8	1.0	4.1	92.9	To-G
15	74.1	0.7	13.3	3.0	0.3	0.9	2.4	1.2	4.1	98.6	To-G
16	73.3	0.6	14.2	2.5	0.3	0.8	3.0	1.1	4.3	95.9	To-G
17	73.9	0.5	14.2	2.4	0.2	0.8	2.7	1.1	4.1	92.5	To-G
18	73.6	0.5	14.3	2.6	0.2	0.8	2.9	1.0	4.2	93.5	To-G
Ave.	73.2	0.6	14.3	2.7	0.2	0.9	2.9	1.1	4.2	95.3	
SD	0.9	0.1	0.3	0.3	0.1	0.1	0.3	0.1	0.1	2.1	

Sample No. 46	SiO ₂	TiO ₂	Al ₂ O ₃	FeO*	MnO	MgO	CaO	K ₂ O	Na ₂ O	Total**	Comment
1	73.4	0.5	14.4	2.7	0.2	0.8	2.8	1.0	4.3	98.3	To-G
2	74.6	0.6	13.4	2.6	0.2	0.7	2.6	1.2	4.1	97.4	To-G
3	74.3	0.5	14.0	2.1	0.2	0.7	2.7	1.2	4.4	94.8	To-G
4	73.8	0.3	14.5	2.4	0.1	0.8	2.8	1.1	4.2	97.9	To-G
5	73.6	0.5	14.1	2.6	0.2	0.8	2.8	1.1	4.2	98.1	To-G
6	73.8	0.6	14.3	2.4	0.1	0.7	2.8	1.1	4.2	98.4	To-G
7	73.1	0.6	14.0	2.6	0.2	0.7	3.0	1.3	4.4	96.7	To-G
8	73.4	0.6	14.3	2.5	0.3	0.8	2.9	1.2	4.2	98.8	To-G
9	75.3	0.5	13.9	2.2	0.1	0.4	2.3	1.3	4.1	98.0	To-G
10	73.2	0.6	14.2	2.6	0.3	0.8	2.9	1.3	4.1	97.5	To-G
11	72.6	0.5	14.7	2.8	0.2	0.9	2.9	1.1	4.3	97.4	To-G
12	73.6	0.5	14.4	2.4	0.1	0.8	2.8	1.1	4.2	98.1	To-G
13	73.9	0.6	14.4	2.2	0.1	0.5	2.8	1.1	4.4	99.4	To-G
14	73.6	0.6	14.4	2.4	0.3	0.8	2.8	1.0	4.2	98.5	To-G
15	74.2	0.6	13.8	2.5	0.2	0.7	2.8	1.0	4.3	96.8	To-G
16	72.9	0.4	14.9	2.5	0.0	0.9	3.1	1.1	4.2	97.4	To-G
17	73.6	0.4	14.3	2.5	0.2	0.8	2.8	1.1	4.2	97.2	To-G
18	73.1	0.5	14.0	2.9	0.3	1.1	3.0	1.0	4.2	97.6	To-G
Ave.	73.7	0.5	14.2	2.5	0.2	0.8	2.8	1.1	4.2	97.7	
SD	0.6	0.1	0.3	0.2	0.1	0.1	0.2	0.1	0.1	1.0	

Sample No. 47	SiO ₂	TiO ₂	Al ₂ O ₃	FeO*	MnO	MgO	CaO	K ₂ O	Na ₂ O	Total**	Comment
1	75.2	0.5	13.2	2.6	0.3	0.6	2.4	1.0	4.1	95.1	To-G
2	73.4	0.5	14.3	2.7	0.1	0.8	2.8	1.0	4.3	94.9	To-G
3	73.3	0.5	14.3	2.7	0.3	0.9	2.8	1.1	4.3	98.1	To-G
4	73.4	0.5	14.2	2.8	0.1	0.8	2.9	1.0	4.3	97.1	To-G
5	73.7	0.5	14.3	2.8	0.1	0.8	2.8	1.1	4.0	92.9	To-G
6	73.8	0.5	14.2	2.8	0.2	0.8	2.8	1.0	3.9	92.2	To-G
7	73.4	0.5	14.3	2.5	0.2	0.8	2.8	1.1	4.4	95.4	To-G
8	73.3	0.5	14.3	2.5	0.2	0.8	2.9	1.1	4.3	97.2	To-G
9	73.6	0.4	14.3	2.5	0.2	0.7	2.8	1.1	4.4	97.1	To-G
10	75.0	0.5	13.3	2.5	0.2	0.8	2.5	0.9	4.3	94.3	To-G
11	74.2	0.6	13.6	2.6	0.3	0.8	2.8	1.1	4.1	93.9	To-G
12	73.3	0.5	14.3	2.6	0.2	0.8	2.8	1.1	4.4	97.3	To-G
13	70.4	0.8	14.6	4.0	0.3	1.1	3.8	1.0	4.0	97.6	To-G
14	74.2	0.5	13.7	2.7	0.3	0.8	2.7	1.0	4.1	93.1	To-G
15	73.4	0.5	14.4	2.6	0.1	0.8	2.8	1.1	4.3	97.1	To-G
16	73.2	0.7	14.2	2.7	0.2	0.8	2.9	1.1	4.3	99.0	To-G
17	73.3	0.6	14.2	2.8	0.2	0.8	2.9	1.0	4.2	97.1	To-G
18	73.3	0.5	14.4	2.4	0.3	0.8	3.0	1.1	4.3	97.9	To-G
Ave.	73.5	0.5	14.1	2.7	0.2	0.8	2.8	1.0	4.2	96.0	

SD	1.0	0.1	0.4	0.3	0.1	0.1	0.3	0.1	0.1	2.0	
Sample No. 48	SiO ₂	TiO ₂	Al ₂ O ₃	FeO*	MnO	MgO	CaO	K ₂ O	Na ₂ O	Total**	Comment
1	67.3	0.9	15.2	5.4	0.2	1.7	4.6	0.9	3.8	99.7	To-Kb
2	68.7	0.9	14.9	4.7	0.3	1.4	4.2	0.9	4.0	98.9	To-Kb
3	69.2	0.6	15.1	4.7	0.0	1.6	4.1	1.0	3.8	97.3	To-Kb
4	68.2	0.9	14.9	5.0	0.2	1.5	4.3	1.0	4.0	99.0	To-Kb
5	71.6	0.8	13.6	4.1	0.2	1.3	3.6	1.1	3.8	97.7	To-Kb
6	70.2	0.8	14.4	4.1	0.3	1.2	3.9	1.0	4.0	98.4	To-Kb
7	70.6	0.8	14.3	3.9	0.2	1.3	4.0	1.0	4.1	97.9	To-Kb
8	66.8	1.0	15.0	5.6	0.3	1.8	4.7	1.0	4.0	98.8	To-Kb
9	69.0	0.7	14.9	4.8	0.1	1.5	4.2	0.8	4.1	98.5	To-Kb
10	67.6	0.9	15.0	5.3	0.2	1.7	4.4	0.9	4.0	98.7	To-Kb
11	68.1	0.9	14.9	5.0	0.4	1.6	4.4	1.0	3.9	98.5	To-Kb
12	66.6	0.9	15.2	5.6	0.2	1.9	5.1	0.9	3.8	97.9	To-Kb
13	69.2	0.8	14.9	4.5	0.2	1.4	4.2	1.0	3.9	98.6	To-Kb
14	71.0	0.7	14.2	4.0	0.2	1.2	3.7	1.0	4.0	98.5	To-Kb
15	66.7	0.9	15.1	5.5	0.2	1.8	4.8	0.9	4.0	99.1	To-Kb
16	69.2	0.9	14.8	4.5	0.3	1.3	4.0	1.0	4.0	99.5	To-Kb
17	69.1	0.8	15.1	4.4	0.2	1.1	4.1	0.9	4.2	98.9	To-Kb
18	69.4	0.7	15.7	3.8	0.2	1.0	4.2	0.9	4.2	98.9	To-Kb
Ave.	68.8	0.8	14.8	4.7	0.2	1.5	4.2	1.0	4.0	98.6	
SD	1.5	0.1	0.5	0.6	0.1	0.3	0.4	0.1	0.1	0.6	
Sample No. 49	SiO ₂	TiO ₂	Al ₂ O ₃	FeO*	MnO	MgO	CaO	K ₂ O	Na ₂ O	Total**	Comment
1	78.4	0.9	10.9	3.0	0.0	0.1	1.1	1.5	4.1	96.5	To-Ok ₂
2	72.8	0.7	13.5	3.4	0.2	0.8	3.1	1.3	4.3	99.2	To-Ok ₂
3	77.2	0.6	12.1	2.7	0.1	0.4	1.8	1.1	4.0	95.3	To-Ok ₂
4	79.3	1.0	11.0	2.9	0.0	0.2	1.1	1.5	3.2	96.3	To-Ok ₂
5	73.8	0.7	13.7	2.8	0.3	0.7	2.7	1.0	4.3	99.1	To-Ok ₂
6	71.1	0.8	14.3	4.2	0.2	1.1	3.7	0.8	3.8	97.6	To-Ok ₂
7	70.8	0.9	14.2	4.0	0.3	1.3	3.8	0.8	3.9	98.1	To-Ok ₂
8	74.9	0.6	13.5	2.7	0.2	0.4	2.4	1.1	4.2	97.4	To-Ok ₂
9	76.6	0.6	12.2	2.9	0.0	0.4	2.0	1.2	4.2	90.2	To-Ok ₂
10	76.2	0.8	12.3	2.9	0.2	0.4	2.0	1.3	4.0	96.6	To-Ok ₂
11	71.3	0.8	14.4	3.9	0.2	1.1	3.6	0.8	3.9	97.7	To-Ok ₂
12	78.5	0.8	11.5	2.3	0.3	0.3	1.5	1.2	3.8	92.5	To-Ok ₂
13	76.8	0.6	12.3	2.8	0.2	0.4	1.8	1.1	4.0	94.5	To-Ok ₂
14	76.6	0.8	12.5	2.5	0.0	0.2	1.9	1.1	4.4	96.7	To-Ok ₂
15	77.5	0.7	12.2	2.2	0.1	0.4	1.8	1.2	4.0	95.4	To-Ok ₂
16	78.2	0.9	10.7	2.9	0.1	0.1	1.4	1.6	4.0	94.7	To-Ok ₂
Ave.	75.6	0.7	12.6	3.0	0.1	0.5	2.2	1.2	4.0	96.1	
SD	2.8	0.1	1.2	0.6	0.1	0.4	0.9	0.2	0.3	2.3	
Sample No. 50	SiO ₂	TiO ₂	Al ₂ O ₃	FeO*	MnO	MgO	CaO	K ₂ O	Na ₂ O	Total**	Comment
1	74.1	0.7	13.7	2.7	0.2	0.7	2.7	0.9	4.3	98.7	To-AP
2	74.2	0.6	13.5	2.7	0.1	0.7	2.8	1.0	4.4	96.5	To-AP
3	73.7	0.7	13.6	2.8	0.3	0.7	2.9	1.0	4.4	95.8	To-AP
4	74.3	0.5	13.6	2.7	0.2	0.7	2.8	0.9	4.3	98.0	To-AP
5	77.0	0.4	12.8	1.8	0.2	0.5	1.9	1.2	4.3	95.9	To-AP
6	74.8	0.5	13.5	2.4	0.2	0.7	2.7	1.0	4.3	97.4	To-AP
7	74.3	0.6	13.6	2.7	0.2	0.8	2.4	1.1	4.5	96.7	To-AP
8	74.9	0.5	13.3	2.7	0.2	0.7	2.5	1.0	4.2	98.1	To-AP
9	73.7	0.6	13.9	2.8	0.2	0.8	2.9	0.9	4.3	96.3	To-AP
10	76.0	0.5	12.9	2.4	0.2	0.7	2.2	0.9	4.2	97.8	To-AP
11	74.2	0.5	13.7	2.8	0.2	0.8	2.7	0.9	4.3	98.0	To-AP
12	74.6	0.6	13.2	2.8	0.2	0.7	2.6	1.0	4.1	97.7	To-AP
13	74.4	0.6	13.5	2.6	0.3	0.8	2.7	0.9	4.3	98.2	To-AP
14	72.6	0.7	14.1	3.1	0.3	0.9	3.2	0.9	4.2	96.9	To-AP
15	74.6	0.6	13.7	2.9	0.3	0.8	2.7	0.8	3.7	92.3	To-AP
16	75.0	0.6	13.2	2.6	0.2	0.7	2.6	0.9	4.3	97.7	To-AP
17	73.2	0.7	14.0	2.9	0.2	0.8	3.0	0.9	4.3	98.0	To-AP
Ave.	74.4	0.6	13.5	2.7	0.2	0.7	2.7	1.0	4.3	97.1	
SD	1.0	0.1	0.4	0.3	0.0	0.1	0.3	0.1	0.2	1.5	
Sample No. 51	SiO ₂	TiO ₂	Al ₂ O ₃	FeO*	MnO	MgO	CaO	K ₂ O	Na ₂ O	Total**	Comment

1	72.8	0.6	13.8	3.8	0.2	0.9	3.1	0.9	3.9	98.3	To-CP
2	73.0	0.7	13.7	3.7	0.2	0.8	3.0	1.1	3.8	98.5	To-CP
3	72.3	0.7	14.0	3.7	0.3	0.9	3.4	0.9	3.9	99.1	To-CP
4	73.1	0.7	13.4	3.8	0.2	0.9	3.0	1.0	3.9	99.0	To-CP
5	72.4	0.7	13.7	3.9	0.4	0.8	3.1	1.0	3.9	99.2	To-CP
6	72.1	0.7	14.0	3.8	0.3	0.9	3.4	1.0	4.0	99.3	To-CP
7	72.8	0.6	13.6	3.9	0.2	0.9	3.3	1.0	3.9	96.6	To-CP
8	72.8	0.6	13.7	3.7	0.1	0.9	3.3	1.0	4.0	97.9	To-CP
9	72.2	0.6	14.1	3.8	0.2	0.9	3.4	0.9	3.9	98.0	To-CP
10	71.8	0.7	13.9	4.0	0.3	1.0	3.4	1.0	4.0	99.1	To-CP
11	72.3	0.7	13.7	4.2	0.2	1.0	3.1	0.9	3.9	99.4	To-CP
12	72.5	0.7	13.9	3.7	0.2	0.9	3.3	1.0	3.8	98.1	To-CP
13	72.5	0.7	13.8	3.7	0.3	0.9	3.2	1.0	3.9	98.7	To-CP
14	73.9	0.8	13.1	3.8	0.2	0.7	2.8	1.0	3.8	98.5	To-CP
15	72.9	0.8	13.6	3.7	0.2	0.8	3.1	1.0	3.9	99.0	To-CP
16	73.0	0.7	13.7	3.6	0.1	0.9	3.1	1.0	3.9	98.5	To-CP
17	72.2	0.7	13.9	3.7	0.2	0.9	3.4	1.0	4.1	98.5	To-CP
Ave.	72.6	0.7	13.7	3.8	0.2	0.9	3.2	1.0	3.9	98.6	
SD	0.5	0.1	0.2	0.1	0.1	0.1	0.2	0.0	0.1	0.7	

Sample No. 52	SiO ₂	TiO ₂	Al ₂ O ₃	FeO*	MnO	MgO	CaO	K ₂ O	Na ₂ O	Total**	Comment
1	75.9	0.3	13.7	1.8	0.2	0.5	2.2	1.0	4.4	94.6	NP
2	76.9	0.3	13.3	1.6	0.2	0.5	2.0	1.1	4.2	93.6	NP
3	76.3	0.4	13.4	1.7	0.3	0.5	2.1	1.2	4.2	94.5	NP
4	77.2	0.3	13.0	1.6	0.3	0.5	1.9	1.0	4.0	94.2	NP
5	77.4	0.3	13.1	1.6	0.1	0.4	1.8	1.2	4.2	93.3	NP
6	76.1	0.3	13.9	1.9	0.1	0.6	2.3	0.9	4.1	92.4	NP
7	75.5	0.4	13.8	2.0	0.4	0.6	2.3	1.1	4.1	93.3	NP
8	76.3	0.3	13.4	1.9	0.3	0.6	2.2	1.0	4.2	93.5	NP
9	77.7	0.3	13.0	1.7	0.0	0.5	1.9	0.9	4.0	93.3	NP
10	77.0	0.4	13.1	1.6	0.3	0.4	2.0	1.1	4.1	89.0	NP
11	76.5	0.3	13.6	1.8	0.1	0.5	2.0	1.0	4.2	93.5	NP
12	76.9	0.3	13.4	1.6	0.2	0.5	1.9	1.0	4.3	94.4	NP
13	77.1	0.2	13.5	1.5	0.0	0.5	1.9	1.0	4.3	94.1	NP
14	76.0	0.4	13.6	1.8	0.2	0.6	2.2	1.0	4.1	93.5	NP
15	75.9	0.4	13.6	1.9	0.2	0.6	2.3	1.1	4.1	92.8	NP
16	77.9	0.1	13.2	1.5	0.1	0.5	1.7	0.9	4.1	91.9	NP
17	76.4	0.4	13.5	1.8	0.1	0.6	2.1	1.1	4.1	93.5	NP
Ave.	76.6	0.3	13.4	1.7	0.2	0.5	2.1	1.0	4.1	93.3	
SD	0.7	0.1	0.3	0.2	0.1	0.1	0.2	0.1	0.1	1.3	

The number on the upper line is the mean value and that on the lower line is the standard deviation. Measured values were recalculated to 100% on a water-free basis. *:Total iron oxide as FeO. **: raw data before recalculations to 100 % on a water-free basis.