

Whole-rock geochemical and electron microprobe data for the Tickville Spring quadrangle, Utah

by

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This Open-File Report makes available raw analytical data from laboratory procedures completed to determine the geochemistry of rock samples collected during geologic mapping partially supported by the Utah Geological Survey (UGS). Additional information about these samples is available in Biek and others (2005), cited below. These data were prepared by ALS Chemex Labs, Inc., Sparks, Nevada, and by Mike Perkins (University of Utah), both under contract to the UGS. These data are highly technical in nature and proper interpretation requires considerable training in applicable geochemical techniques.

Disclaimer

This Open-File release is intended as a data repository for technical analytical information gathered in support of geologic mapping of the Tickville Spring quadrangle. These data may not conform to UGS technical or editorial standards. Therefore, it may be premature for an individual or group to take actions based on the contents of this report.

Geologic mapping of the Tickville Spring quadrangle was funded by the Utah Geological Survey and the U.S. Geological Survey, National Cooperative Geologic Mapping Program through USGS STATEMAP award number 03HQAG0096. The views and conclusions contained in this document are those of the authors and should not be interpreted as necessarily representing the official policies, either expressed or implied, of the U.S. Government.

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Reference to geologic report that cites or explains samples analyzed in the report

Biek, R.F., Solomon, B.J., Keith, J.D., and Smith, T.W., 2005, Geologic map of the Tickville Spring quadrangle, Salt Lake and Utah Counties, Utah: Utah Geological Survey Map 214, 2 plates, scale 1:24,000.

Table 1. Electron microprobe analyses of glass shards.

Sample	Latitude	Longitude	Number	Si	Ti	Al	Fe	Mn	Mg	Ca	Ba	K	Na	Cl	O	F	Total
TS9903-2	40 25' 29.2"	112 02' 09.0"	20	34.73	0.12	6.07	0.87	0.021	0.054	0.338	0.054	4.39	2.24	0.105	47.14	n.a.	96.27
TS101904-1	40 25' 18.0"	112 01' 55.0"	19	34.70	0.11	6.07	0.87	0.038	0.050	0.338	0.058	4.33	2.28	0.104	47.09	n.a.	96.19

Number = number of glass shards analyzed.

Analyses represent means in weight percent.

Analyses performed by Mike Perkins, University of Utah.

n.a. = not analyzed.

Latitude and longitude based on NAD83.

Table 2. Major and trace element whole-rock analyses.

SAMPLE	Unit	Rock Type	Rock Name	Latitude	Longitude	SiO2	Al2O3	Fe2O3	CaO	MgO	Na2O	K2O	Cr2O3	TiO2	MnO
TS102103-3	Tvfo	lava flow	basalt/basaltic andesite	40 25' 10.7"	112 03' 42.4"	49.92	15.92	11.09	7.50	5.93	2.96	1.43	0.02	1.77	0.11
TS102103-4	Tid	dike	dacite	40 25' 11.5"	112 03' 50.4"	66.21	15.87	3.73	3.11	1.39	3.33	3.63	<0.01	0.60	0.04
TS102103-5	Tid	dike	dacite	40 25' 05.7"	112 03' 57.6"	66.28	15.60	4.20	3.14	1.40	3.21	3.67	<0.01	0.57	0.04
TS102103-6	Tvfo	lava flow	basaltic andesite	40 25' 03.0"	112 03' 59.8"	51.04	17.71	10.03	8.13	3.42	3.13	1.39	0.02	1.82	0.09
TS102103-7	Tvby	block and ash flow tuff	dacite	40 24' 52.6"	112 04' 14.9"	63.28	16.50	4.70	3.75	1.28	3.32	3.01	<0.01	0.55	0.05
TS102203-2	Tvfy	lava flow	dacite	40 26' 05.5"	112 03' 09.9"	67.30	16.84	2.20	2.53	0.93	3.27	3.12	0.01	0.55	0.01
TS102203-3	Tvby	lava flow	dacite/rhyolite	40 26' 42.9"	112 03' 33.5"	68.57	16.68	2.24	2.35	0.49	3.16	3.33	<0.01	0.64	0.01
TS102203-4	Tvby	lava flow	dacite	40 26' 49.8"	112 03' 24.8"	66.09	16.34	3.41	2.84	0.66	3.42	3.16	0.01	0.61	0.01
TS102303-1	Trf	Tickville rhyolite flow	rhyolite	40 25' 16.0"	112 01' 45.1"	71.50	10.01	4.37	0.52	0.19	1.54	3.41	<0.01	0.18	0.05
TS102303-4	Trf	Tickville rhyolite flow	rhyolite	40 25' 12.2"	112 01' 15.6"	69.58	13.74	0.78	0.47	0.09	1.94	3.88	<0.01	0.14	0.06
TS102303-6	Trf	Tickville rhyolite flow	rhyolite	40 25' 36.0"	112 01' 11.6"	69.41	13.37	1.53	0.47	0.08	1.47	4.11	<0.01	0.13	0.06
TS102803-1	Tvfy	lava flow	dacite	40 25' 56.4"	112 04' 52.3"	61.46	16.82	5.18	4.49	2.32	3.28	2.81	<0.01	0.73	0.06
TS102803-2	Tvfy	lava flow	dacite	40 25' 49.0"	112 04' 10.3"	65.21	16.03	4.44	3.42	1.51	3.37	3.11	<0.01	0.56	0.05
TS102803-3	Tvby	block and ash flow tuff clast	andesite/dacite	40 26' 27.1"	112 05' 00.8"	61.20	16.89	5.44	4.81	2.41	3.32	2.71	0.01	0.74	0.07
TS102803-7	Tvby	block and ash flow tuff clast	dacite	40 26' 14.1"	111 05' 26.3"	60.91	16.18	5.08	4.64	2.19	2.93	3.08	0.01	0.71	0.06
TS111203-1	Tia	plug	andesite	40 26' 35.2"	112 01' 56.3"	59.01	16.19	6.37	6.30	3.64	3.13	2.27	0.01	0.93	0.07
TS111203-2	Tvfy	lava flow	dacite	40 26' 24.5"	112 02' 10.8"	67.25	17.00	1.82	3.26	0.82	3.44	3.66	0.01	0.64	0.01
TS111803-3	Tvfy	lava flow	andesite/dacite	40 26' 18.5"	112 02' 15.4"	61.03	16.83	5.43	4.79	2.49	3.14	2.52	<0.01	0.76	0.06
TS31004-1	Trb	Tickville rhyolite breccia	rhyolite	40 24' 48.5"	112 00' 40.6"	67.90	14.31	1.39	1.38	0.28	2.50	4.50	<0.01	0.16	0.08
TS31004-2	Tvby	block and ash flow tuff clast	rhyolite	40 24' 46.9"	112 00' 41.2"	68.84	16.10	1.87	2.51	0.51	3.31	3.16	0.01	0.69	<0.01
TS31004-3	Tid	dike	dacite	40 24' 48.1"	112 00' 36.1"	63.10	15.45	4.27	3.79	1.82	3.10	3.40	0.02	0.65	0.05
TS31904-1	Tvfs	South Mountain flow	andesite/latite	40 28' 58.2"	112 01' 31.1"	58.90	16.10	6.00	5.71	2.53	3.57	2.78	0.01	0.78	0.07
TS31904-2	Tvfy	lava flow	andesite/dacite	40 28' 21.2"	112 01' 31.4"	61.42	16.80	5.92	4.66	2.06	3.21	2.81	0.01	0.86	0.06
TS31904-3	Tvbs	South Mountain breccia	dacite	40 28' 28.9"	112 01' 54.2"	62.00	16.58	5.20	4.49	2.08	3.44	3.21	0.01	0.78	0.06
TS31904-6	Tvfou	lava flow	trachydacite	40 28' 10.5"	112 05' 29.0"	60.10	14.90	5.10	4.68	2.99	2.76	5.12	0.02	0.69	0.05
TS32504-1	Tvfs	South Mountain flow	dacite	40 29' 03.9"	112 02' 18.9"	62.56	16.44	5.25	3.93	1.95	3.55	3.25	<0.01	0.77	0.06
TS32504-2	Tvfy	lava flow	dacite	40 29' 17.1"	112 01' 59.3"	62.75	16.35	5.08	3.56	1.97	3.11	2.76	<0.01	0.54	0.05
TS32504-4	Tvfs	South Mountain flow	andesite/dacite	40 28' 25.4"	112 03' 01.4"	60.99	17.00	6.20	3.96	1.61	3.45	3.10	0.08	0.90	0.07
TS32504-5	Tvfy	lava flow	trachydacite	40 28' 27.9"	112 03' 42.3"	63.50	15.50	5.21	3.25	1.90	3.16	4.66	0.01	0.67	0.03
TS32904-2	Tism	Step Mountain dike	andesite	40 28' 30.3"	112 04' 04.8"	59.25	15.25	6.02	5.66	3.37	2.91	3.10	<0.01	0.71	0.09
TS32904-3	Tism	Step Mountain dike	andesite	40 28' 26.5"	112 04' 00.2"	58.67	15.47	6.10	5.81	3.33	3.00	3.14	<0.01	0.73	0.09
TS32904-6	Tvbs	South Mountain breccia clast	trachydacite/dacite	40 28' 16.7"	112 04' 04.3"	61.54	16.03	4.85	4.19	1.94	3.11	3.71	<0.01	0.70	0.06
TS33004-2	Tvfy	lava flow	dacite/andesite	40 27' 28.3"	112 05' 04.8"	61.09	16.44	5.70	4.53	2.02	3.41	2.99	<0.01	0.84	0.06
TS33004-4	Tvfy	lava flow	dacite	40 27' 37.1"	112 03' 45.0"	60.93	15.90	5.37	4.48	2.37	3.19	3.20	<0.01	0.80	0.06
TS33004-7	Tvfou	lava flow	latite	40 28' 43.0"	112 05' 13.8"	58.19	15.35	6.79	4.94	3.00	3.21	4.33	<0.01	0.89	0.05
TS33104-1	Tvfou	lava flow	dacite	40 29' 20.0"	112 05' 10.0"	63.23	16.40	4.16	3.66	2.10	3.20	3.65	<0.01	0.51	0.04
TS33104-2	Tvfou	lava flow	dacite/trachydacite	40 29' 24.9"	112 05' 16.3"	65.92	16.41	4.34	2.80	0.62	3.30	4.18	<0.01	0.51	0.04
TS33104-3	Tisp	Shaggy Peak plug	rhyolite	40 29' 39.1"	112 05' 10.1"	72.95	13.38	1.30	1.60	0.37	3.21	4.30	<0.01	0.18	0.05
TS33104-4	Tisp	Shaggy Peak plug	rhyolite	40 29' 44.1"	112 05' 05.7"	74.00	13.45	1.23	1.16	0.36	3.26	4.39	<0.01	0.15	0.06
TS33104-5	Tvfou	lava flow	dacite	40 29' 29.5"	112 05' 29.0"	64.65	16.13	4.01	2.81	1.02	3.16	4.15	<0.01	0.52	0.02
TS41604-1	Tvfo	lava flow	andesite	40 26' 52.3"	112 06' 46.5"	57.65	13.94	5.19	6.49	4.65	2.24	3.67	0.08	0.73	0.05
TS42304-1	Tvfo	lava flow	latite	40 28' 03.4"	112 07' 14.2"	59.00	14.80	5.77	5.60	3.89	2.79	4.81	0.01	0.67	0.06
TS42804-1	Tvfou	lava flow	andesite	40 29' 26.8"	112 06' 04.4"	57.49	15.78	5.89	7.26	3.70	2.65	2.35	0.04	0.89	0.09
TS50504-1	Til	Lark intrusion	dacite	40 29' 51.8"	112 06' 29.9"	66.75	15.52	3.45	2.67	1.72	3.49	3.43	0.01	0.41	0.01
TS91103-1	Tid	dike	dacite	40 25' 22.5"	112 01' 22.7"	65.89	16.72	3.15	2.79	0.62	3.17	3.58	<0.01	0.63	<0.01
TS91103-2	Trf	Tickville rhyolite flow	rhyolite	40 25' 24.9"	112 01' 24.9"	70.39	14.47	0.85	0.40	0.07	2.28	3.65	<0.01	0.14	0.01
TS9803-1	Trf	Tickville rhyolite flow	rhyolite	40 25' 05.7"	112 01' 45.2"	71.75	14.40	0.92	0.68	0.12	2.32	3.87	0.01	0.15	0.06

Notes: Major oxides reported in weight percent by X-Ray Fluorescence; minor and trace elements reported in ppm by Inductively Coupled Plasma-Mass Spectrometry.

All analyses performed by ALS Chemex Labs, Inc., Sparks, NV.

Latitude and longitude based on NAD83.

Rock name using TAS diagram of LeBas and others (1986).

P2O5	SrO	BaO	LOI	Total	Ag	Ba	Ce	Co	Cr	Cs	Cu	Dy	Er	Eu	Ga	Gd	Hf	Ho	La
0.45	0.07	0.12	0.99	98.27	1	1010	80.8	32.8	170	0.7	42	3.7	2.0	1.8	19	5.8	4	0.7	42.2
0.26	0.06	0.17	1.26	99.65	<1	1520	123.5	9.7	80	2.4	19	3.1	1.8	1.5	20	6.1	6	0.6	70.0
0.26	0.06	0.17	0.97	99.56	<1	1495	120.5	9.3	20	3.3	16	2.8	1.5	1.4	20	5.8	6	0.5	67.2
0.51	0.07	0.13	2.41	99.89	<1	1285	93.1	33.0	210	0.3	27	4.2	2.2	2.1	21	6.8	4	0.8	49.5
0.23	0.06	0.16	2.61	99.51	<1	1470	122.5	9.8	20	1.7	14	3.4	2.0	1.5	21	6.0	5	0.7	69.4
0.17	0.06	0.18	2.50	99.65	<1	1595	115.5	4.5	70	1.2	7	3.2	1.9	1.5	21	5.7	5	0.6	67.1
0.12	0.06	0.20	2.10	99.93	<1	1770	108.0	3.9	20	1.5	16	2.8	1.6	1.5	21	5.3	6	0.5	65.7
0.24	0.07	0.18	1.40	98.44	<1	1645	132.0	7.1	80	1.5	9	5.3	3.1	1.9	21	8.4	6	1.1	74.6
0.08	0.01	0.18	7.81	99.85	<1	1685	17.1	7.2	<10	2.2	7	2.1	1.3	0.4	14	1.7	4	0.4	8.5
0.10	0.02	0.19	7.22	98.22	<1	1690	60.5	0.5	60	2.3	5	2.6	1.6	0.7	18	3.6	4	0.5	31.0
0.07	0.02	0.19	7.52	98.42	<1	1880	60.8	0.7	10	2.7	6	2.7	1.7	0.8	17	3.7	4	0.5	30.7
0.30	0.07	0.17	2.03	99.71	<1	1545	116.5	14.4	90	1.7	16	3.9	2.3	1.8	22	7.0	6	0.7	69.3
0.23	0.06	0.17	1.54	99.70	<1	1575	118.0	10.2	20	2.2	12	3.2	1.9	1.5	20	6.0	5	0.6	66.6
0.33	0.08	0.18	1.75	99.93	<1	1605	126.5	16.0	110	2.4	19	3.8	2.2	1.8	21	7.1	6	0.7	72.5
0.32	0.07	0.16	2.41	98.75	<1	1470	125.0	14.3	120	2.5	21	3.4	1.9	1.6	23	6.7	6	0.6	70.9
0.43	0.08	0.18	1.07	99.69	<1	1785	144.5	24.1	200	2.7	32	3.4	1.8	1.8	22	7.1	6	0.6	74.2
0.34	0.06	0.19	0.97	99.46	<1	1665	149.0	6.7	140	4.1	18	3.3	1.8	1.6	24	7.0	8	0.6	83.1
0.29	0.06	0.17	2.02	99.58	<1	1660	112.0	16.2	110	1.7	22	3.5	1.9	1.6	22	6.7	7	0.7	67.0
0.08	0.02	0.16	6.07	98.84	<1	1745	65.9	6.4	60	2.6	<5	3.2	1.9	0.7	18	4.0	4	0.7	32.7
0.12	0.06	0.27	2.40	99.87	<1	2530	93.4	6.7	150	1.2	9	2.1	1.3	1.2	22	4.3	6	0.4	62.3
0.23	0.06	0.17	2.10	98.22	<1	1560	128.0	13.0	190	3.4	19	2.6	1.5	1.4	23	6.0	6	0.6	70.1
0.31	0.07	0.16	1.38	98.37	<1	1670	130.0	17.4	180	1.9	29	2.9	1.9	1.6	22	5.6	6	0.6	67.9
0.34	0.07	0.17	1.14	99.52	<1	1580	129.5	17.1	150	1.8	27	3.4	1.9	1.6	24	6.5	6	0.7	70.8
0.34	0.08	0.18	1.44	99.87	<1	1715	151.5	15.2	120	2.9	21	3.5	2.0	1.7	23	7.0	7	0.7	82.8
0.40	0.15	0.32	1.57	98.86	<1	3000	227.0	18.8	260	3.0	58	3.6	1.9	2.5	24	9.9	9	0.7	130.0
0.33	0.07	0.18	0.66	99.00	<1	1785	140.5	15.4	140	2.6	23	3.2	1.8	1.8	24	6.4	6	0.6	75.5
0.23	0.08	0.16	3.08	99.72	<1	1385	102.0	13.0	100	2.8	17	3.4	2.2	1.7	22	6.6	5	0.8	56.5
0.30	0.07	0.19	1.25	99.16	<1	1905	136.5	19.0	140	1.9	36	3.7	2.1	2.1	27	7.4	7	0.7	78.3
0.30	0.08	0.25	1.36	99.87	<1	2400	222.0	13.4	160	3.9	87	4.9	2.8	2.3	24	9.6	10	0.8	133.0
0.37	0.15	0.32	1.06	98.27	<1	3020	217.0	20.5	110	2.8	30	4.3	2.3	2.4	21	10.4	6	0.8	118.0
0.40	0.15	0.33	1.09	98.32	<1	3170	225.0	20.9	120	3.0	35	4.2	2.4	2.5	22	9.7	6	0.8	122.5
0.40	0.08	0.22	2.06	98.90	<1	2090	187.5	12.8	40	3.2	10	3.5	2.0	1.9	22	8.4	7	0.7	103.0
0.36	0.07	0.17	0.91	98.59	<1	1715	144.5	17.2	100	1.5	23	3.6	2.1	1.7	23	6.9	7	0.7	79.4
0.37	0.07	0.22	1.35	98.32	<1	2200	160.0	15.9	70	2.7	14	3.3	1.8	1.7	22	7.1	7	0.6	86.2
0.42	0.10	0.23	1.34	98.85	<1	2400	204.0	19.0	120	3.2	59	4.5	2.4	2.3	24	10.7	10	0.8	115.5
0.26	0.10	0.27	2.37	99.96	<1	2600	154.0	11.0	70	1.7	19	3.0	1.6	1.8	23	7.2	7	0.5	89.0
0.29	0.10	0.26	0.98	99.75	<1	2550	151.5	10.6	70	2.9	14	3.1	1.7	1.9	23	7.0	7	0.6	85.9
0.08	0.01	0.06	0.79	98.30	<1	598	55.3	2.0	80	5.3	8	3.2	2.0	0.6	18	3.9	4	0.7	29.0
0.05	0.01	0.06	0.52	98.71	<1	571	51.2	1.9	110	5.6	7	3.4	2.2	0.6	18	4.0	3	0.7	27.0
0.26	0.12	0.26	1.29	98.40	<1	2430	145.0	9.1	70	2.3	25	3.1	1.6	1.8	22	6.7	7	0.5	82.1
0.42	0.08	0.22	3.56	98.97	<1	2100	104.5	22.0	780	2.0	54	3.9	2.0	2.1	20	7.2	6	0.7	59.8
0.49	0.19	0.44	1.30	99.82	<1	4170	308.0	23.2	180	2.7	54	5.1	2.4	3.5	23	14.0	9	0.8	165.5
0.31	0.07	0.15	2.55	99.23	<1	1540	120.5	20.7	540	1.0	26	3.9	2.2	1.9	23	6.8	5	0.7	67.5
0.18	0.10	0.26	1.85	99.85	<1	2330	110.0	9.8	160	2.0	14	1.8	1.0	1.2	23	5.1	5	0.4	66.5
0.27	0.07	0.23	2.60	99.72	<1	2130	127.5	4.2	20	2.9	23	3.6	2.2	1.6	21	6.5	6	0.7	70.4
0.14	0.05	0.33	5.68	98.46	<1	3030	61.3	1.8	80	1.0	6	2.3	1.3	0.8	17	3.7	4	0.4	30.9
0.07	0.03	0.19	5.20	99.77	<1	1795	64.0	0.5	80	2.5	<5	3.1	1.8	0.9	17	3.9	4	0.6	32.4

Lu	Mo	Nb	Nd	Ni	Pb	Pr	Rb	Sm	Sn	Sr	Ta	Tb	Th	Tl	Tm	U	V	W	Y
0.2	3	15	35.4	91	41	9.6	24.1	5.9	28	731	0.9	0.8	6	<0.5	0.2	1.1	253	2	18.8
0.2	2	16	42.9	9	31	13.4	123.0	6.1	2	522	1.6	0.7	26	0.7	0.2	4.0	80	2	16.2
0.2	3	16	42.0	8	30	13.0	127.0	5.9	2	524	1.6	0.7	26	0.7	0.2	5.5	74	2	14.2
0.3	2	14	41.9	88	8	11.4	18.2	7.1	1	826	0.9	0.9	6	<0.5	0.3	1.1	361	1	21.1
0.3	3	16	41.0	8	22	12.9	102.0	6.0	2	589	1.1	0.8	17	0.6	0.3	3.2	72	2	18.4
0.3	<2	17	37.8	<5	23	12.1	91.6	5.3	2	602	1.3	0.7	18	0.6	0.2	3.2	70	2	18.3
0.2	<2	19	37.4	<5	24	12.0	93.6	5.5	2	567	1.4	0.6	20	<0.5	0.2	3.5	59	3	14.8
0.4	2	18	51.4	7	22	15.2	90.7	8.0	2	589	1.3	1.1	18	0.6	0.4	3.1	82	2	32.4
0.2	4	22	6.2	<5	24	2.0	101.0	1.6	2	119.5	1.5	0.3	7	0.6	0.2	3.9	<5	4	13.6
0.2	4	20	19.5	<5	23	6.5	112.0	3.5	2	213	1.5	0.5	15	0.6	0.2	4.6	<5	2	15.2
0.2	4	21	20.1	<5	17	6.6	115.5	3.7	2	177.5	1.5	0.5	16	0.7	0.2	4.6	5	4	16.6
0.3	3	16	46.4	15	25	13.8	74.3	6.9	2	673	1.1	0.9	16	0.6	0.3	3.2	122	2	21.5
0.3	3	17	39.9	8	21	12.4	93.9	5.8	2	582	1.2	0.7	17	0.6	0.2	3.9	81	3	18.1
0.3	3	16	47.8	16	17	14.4	86.3	7.1	2	739	1.1	0.9	17	0.6	0.3	3.5	131	2	20.9
0.2	3	18	48.6	18	26	14.2	84.9	5.9	2	752	1.1	0.7	17	<0.5	0.3	3.3	94	2	20.6
0.2	<2	17	53.7	57	19	15.4	81.3	6.9	2	827	1.1	0.7	18	0.5	0.2	3.1	160	2	20.9
0.2	2	19	53.2	13	27	16.0	146.5	6.3	2	688	1.4	0.7	27	<0.5	0.2	7.5	64	2	22.6
0.3	2	16	46.5	34	26	13.6	73.3	6.0	2	704	1.1	0.7	16	<0.5	0.3	3.0	108	2	21.5
0.3	3	24	19.8	9	29	6.2	113.0	3.6	2	166.5	1.4	0.6	16	<0.5	0.3	4.6	<5	5	21.7
0.2	2	21	30.3	12	28	9.6	84.3	4.1	2	636	1.2	0.5	18	<0.5	0.2	4.1	55	3	12.6
0.2	3	17	42.1	18	34	12.4	99.3	5.7	2	668	1.2	0.7	22	<0.5	0.2	6.4	80	3	15.2
0.2	2	18	42.1	31	20	12.4	76.4	6.5	2	725	1.2	0.7	18	<0.5	0.2	3.9	104	3	18.5
0.3	3	19	45.1	28	30	13.2	80.7	6.3	2	695	1.2	0.8	19	<0.5	0.3	4.3	110	3	18.8
0.3	2	20	49.7	20	37	14.6	94.6	7.1	2	717	1.3	0.8	24	<0.5	0.3	5.4	90	3	20.9
0.2	2	18	78.3	70	59	23.2	132.0	10.2	4	1625	1.0	1.1	34	<0.5	0.2	5.4	110	2	19.2
0.2	2	20	47.4	19	34	13.5	89.1	7.0	4	740	1.4	0.8	23	<0.5	0.2	5.4	86	4	18.4
0.3	<2	11	42.8	15	27	11.8	86.5	6.5	5	860	0.7	0.8	12	<0.5	0.3	3.4	79	3	21.3
0.3	2	22	50.8	31	31	14.4	102.5	7.4	4	810	1.5	0.9	23	<0.5	0.3	5.6	126	3	20.9
0.3	4	23	78.1	53	56	23.1	207.0	12.4	5	880	1.5	1.1	59	0.5	0.3	10.0	105	4	30.8
0.3	2	11	81.9	27	64	23.4	83.0	11.4	2	1430	0.7	1.1	19	<0.5	0.3	4.3	140	1	22.3
0.3	2	12	84.9	29	54	24.4	79.1	12.2	2	1455	0.7	1.0	20	<0.5	0.3	4.2	146	2	22.8
0.3	3	19	69.1	14	36	19.8	98.3	9.6	2	798	1.2	0.9	25	<0.5	0.3	5.5	85	3	19.4
0.2	2	18	54.3	39	24	15.4	83.9	8.2	2	662	1.0	0.8	17	<0.5	0.3	3.6	110	2	21.1
0.2	3	18	56.7	27	24	16.6	92.0	8.1	2	744	1.1	0.8	21	<0.5	0.2	4.5	107	2	18.2
0.3	3	22	81.0	39	50	23.4	153.0	12.2	2	948	1.2	1.1	38	<0.5	0.3	7.7	159	4	23.7
0.2	<2	14	57.6	16	46	16.6	82.6	8.6	2	979	0.8	0.8	26	<0.5	0.2	3.6	76	2	16.8
0.2	<2	15	55.5	17	48	16.0	132.0	8.4	3	956	0.8	0.8	26	<0.5	0.2	4.7	84	1	18.0
0.3	<2	18	21.6	<5	48	6.3	178.5	4.5	2	156	1.6	0.6	21	<0.5	0.3	5.0	12	1	20.1
0.4	<2	20	20.1	5	48	6.0	178.5	4.2	2	142.5	1.6	0.6	20	<0.5	0.3	4.8	12	2	22.0
0.2	<2	15	51.2	18	46	15.8	128.5	8.5	2	927	0.8	0.7	24	<0.5	0.2	4.6	82	5	16.4
0.2	2	11	47.4	141	35	13.2	110.0	8.6	1	817	0.8	0.8	18	<0.5	0.2	2.6	132	7	18.4
0.3	2	20	123.0	87	68	34.1	144.5	16.7	2	2090	1.0	1.3	42	<0.5	0.2	8.1	136	4	24.4
0.3	2	14	47.5	54	65	13.4	64.6	7.3	1	851	0.7	0.8	15	<0.5	0.2	2.1	170	1	21.0
0.1	<2	10	41.6	31	42	12.4	101.0	5.4	1	1035	0.6	0.5	19	<0.5	0.1	3.3	61	1	9.0
0.3	2	16	44.0	<5	38	13.6	114.5	6.5	14	633	1.5	0.8	25	0.6	0.3	6.6	72	3	23.2
0.2	4	21	20.6	<5	26	6.7	71.2	3.8	6	461	1.5	0.5	16	0.7	0.2	4.8	<5	2	13.1
0.3	3	21	21.7	<5	83	7.0	111.0	3.9	57	224	1.5	0.6	16	0.6	0.3	4.8	<5	2	18.6

Yb	Zn	Zr
1.6	341	141.0
1.5	87	197.0
1.3	67	188.5
1.7	113	156.5
1.8	67	196.0
1.7	56	189.5
1.5	37	219.0
2.7	66	211.0
1.3	40	107.0
1.4	53	98.1
1.5	38	97.7
1.9	77	205.0
1.7	69	194.5
1.8	79	198.0
1.6	74	211.0
1.5	79	199.5
1.5	74	280.0
1.7	86	229.0
1.8	57	69.5
1.3	43	197.5
1.3	77	162.0
1.5	86	173.0
1.6	81	173.0
1.8	83	216.0
1.5	79	266.0
1.5	88	192.5
1.7	92	150.0
1.7	118	235.0
2.1	81	299.0
1.9	84	190.0
1.9	82	204.0
1.6	78	246.0
1.7	80	225.0
1.5	77	221.0
1.7	100	334.0
1.3	60	237.0
1.5	57	246.0
2.0	34	88.8
2.2	34	74.4
1.4	65	243.0
1.5	76	196.0
1.8	85	311.0
1.8	88	187.5
0.9	63	173.0
1.8	67	210.0
1.2	24	101.0
1.7	44	104.5