

TABLE 1. Major, Minor and Trace Element Composition of Tutum Bay Hydrothermal Fe(III) oxyhydroxide Precipitates

Sample	Unit	FV-1A	FV-1B	V-1B	V-2B I	V-2B II	V-2B III	V-4.1D
SiO ₂	%	20.90	14.50	14.10	13.30	12.30	17.20	14.80
TiO ₂	%	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.12
Al ₂ O ₃	%	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	1.04
Fe ₂ O ₃ ^T	%	44.70	52.50	50.90	52.70	54.10	50.80	44.40
MnO	%	0.09	0.08	0.11	0.07	0.07	0.07	0.08
MgO	%	0.83	0.73	1.07	0.78	0.82	1.07	1.28
CaO	%	2.57	1.70	2.51	1.82	1.96	1.63	7.09
Na ₂ O	%	0.69	0.48	0.67	0.82	1.09	0.76	0.96
K ₂ O	%	0.20	0.15	0.17	0.12	0.14	0.16	0.33
P ₂ O ₅	%	0.21	0.22	0.19	0.22	0.25	0.20	0.26
CO ₂ ^T	%	0.2	0.2	2.1	1.5	1.6	1.3	7.1
LOI	%	22.4	21.9	18.3	18.3	18.7	19.6	19.2
S ^T	%	0.05	0.03	<0.02	0.02	0.04	<0.02	<0.02
Total	%	93.1	91.8	89.8	89.8	90.9	93.2	96.2
Ag	ppm	0.2	0.1	1.5	0.4	0.3	0.4	5.6
Au	ppb	<17	<17	<41	<40	<41	<40	<40
As	ppm	55000	49000	57000	60000	62000	54000	49000
Ba	ppm	180	220	80	110	130	100	70
Be	ppm	35	50	42	39	34	38	28
Br	ppm	<5	11	<4	<5	<4	<5	<4
Co	ppm	<5	<5	<5	<5	<5	<5	9
Cr	ppm	24	30	28	16	26	31	45
Cs	ppm	5.3	3.5	1	1.1	0.98	1.9	3.2
Cu	ppm	33	41	14	15	15	13	160
Ga	ppm	2.1	1	0.9	0.8	0.9	0.9	3.1
Hf	ppm	<0.05	0.06	<0.05	<0.05	<0.05	<0.05	0.17
Hg	ppm	<5	<1	<5	<5	<5	<5	<5
In	ppm	<0.05	<0.05	0.08	0.08	0.06	0.08	0.06
Mo	ppm	3.6	1.7	0.8	0.8	0.7	0.8	1.3
Nb	ppm	<10	<10	<10	<10	<10	<10	18
Ni	ppm	0.08	0.29	0.25	0.18	0.23	0.2	0.55
Pb	ppm	16	35	14	15	16	15	49
Rb	ppm	13	7.1	3.9	3.8	3.9	5.5	9.7
Sb	ppm	240	260	170	180	160	190	190
Sc	ppm	<0.5	<0.5	1.1	0.8	0.8	0.8	3.6
Se	ppm	<6	<3	<6	<11	<6	<11	<6
Sr	ppm	1100	770	910	940	940	780	1500
Th	ppm	<0.02	0.13	0.03	<0.02	<0.02	<0.02	0.09
Tl	ppm	4.2	3.1	0.82	2	1.9	1.9	0.59
U	ppm	0.92	0.63	0.73	0.34	0.58	0.47	0.88
V	ppm	<5	<5	14	<5	6	<5	80
W	ppm	<12	<7	<10	<10	<11	<11	<10
Y	ppm	10	18	21	9.3	8.1	9.1	20
Zn	ppm	33	56	40	29	24	32	49
Zr	ppm	1	3.2	1.1	1	1	1	6.6

TABLE 2. Proton probe traverse across differently colored layers in Fe(III) oxyhydroxide

Point	1	2	3	4	5	6	7	8	9
Color	orange brown	orange	orange brown	dark brown	dark brown	brown	orange brown	dark brown	brown
Fe	380000 ^a	330000	420000	370000	407000	420000	410000	390000	430000
As	59000	54000	55000	76000	64000	65000	57000	71000	61000
Zn	57	73	76	78	73	70	68	88	63
Sr	350	390	350	1000	700	490	380	700	300
Sb	200	160	220	240	260	290	260	150	220
Ta	160	<30	<30	190	170	140	130	170	150
Ni	<24	<24	<24	105	<24	<24	<24	<24	<24
Cu	<17	<17	<17	73	<17	72	<17	<17	80
Y	<6	<6	20	<6	<6	<6	<6	<6	20

^a All analyses in parts per million (ppm)