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Appendix: Analyses of Accreted Volcanic and Hypabyssal Rocks Tables 1–17

in

Chapter 17
(Pages 1–31)

Some accreted volcanic rocks of Alaska and their elemental abundances

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TABLE 1. MAJOR- AND MINOR-ELEMENT ANALYSES OF METABASITES OF SEWARD PENINSULA*

Sample Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14
SiO_2	41.52	41.91	45.52	46.49	46.81	46.96	47.01	47.3	47.92	48.42	50.28	50.85	51.22	51.86
Al_2O_3	10.82	11.05	13.13	17.04	15.21	17.65	13.59	14.52	15.75	16	15.9	14.1	14.76	13.88
Fe_2O_3	7	4.52	4.18	3.68	2.87	2.05	4.26	6.04	0.33	2.24	3.31	3.04	5.97	3.18
FeO	15.83	14.65	12.11	9.56	11.38	9.02	11.98	9.55	9.32	7.98	9.49	12.89	7.91	11.95
MgO	7.87	6.64	5.52	4.79	7.42	4.39	5.4	6.18	9.48	8.79	9.09	5.17	6.5	6.05
CaO	10.05	10.95	10.15	11.58	9.93	10.08	8.28	10.36	13.66	13.56	4.73	9.36	10.38	6.09
Na_2O	2.17	2.45	3.11	3.05	2.52	4.96	3.47	2.05	2.2	1.42	5.45	2.28	1.71	4.79
K_2O	0.2	0.07	0.1	0.09	0.61	0.16	0.94	0.01	0.07	0.15	0.09	0.17	0.08	0.26
TiO_2	4.7	7.72	6.03	3.71	2.84	4.67	4.58	3.72	1.01	1.31	1.55	1.92	1.64	1.76
P_2O_5	0.3	0.23	0.38	0.24	0.5	0.19	0.6	0.63	0.12	0.17	0.29	0.29	0.21	0.28
MnO	0.26	0.25	0.19	0.12	0.23	0.08	0.32	0.24	0.17	0.19	0.16	0.24	0.22	0.23
LOI	2.08	0.97	2.51	2.78	3.21	4.61	3.97	3.87	8.16	3.24	6.06	2.52	4.19	3.36
Sc	56	51	40	31	33	33	38	40	49	48	37	44	43	44
Cr	159	14	0	49	195	15	6	100	412	263	71	16	68	45
Co	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Ni	202	34	71	67	125	58	35	71	118	128	89	51	90	73
Cu	350	54	71	206	75	100	49	42	122	140	83	243	186	63
Rb	†	†	16	†	15	†	26	17	†	†	†	†	†	†
Sr	147	111	564	1049	334	698	176	908	391	165	147	140	268	427
Y	29	23	31	22	36	23	44	44	17	23	23	37	32	46
Zr	103	180	141	88	171	82	109	180	44	73	240	80	109	90
Nb	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Ba	56	56	186	94	199	89	193	28	17	34	77	44	14	181
La	15.2	9.7	19.3	13.2	24.2	14.2	25.7	22.2	3	5	19.2	8.6	12.4	16.7
Ce	31.4	18.4	42.4	27.9	45.8	30.1	60	49.2	8.5	12.7	37.8	21.6	24.5	28.8
Nd	20.2	11.8	31.4	18.8	25.7	15.8	28.6	36.1	8.8	11	33	16.7	23.8	26
Sm	3	2.7	7.4	4.5	6.8	4.7	9.5	8.3	1.9	2.7	4.5	3.6	4.2	5.5
Eu	0.73	0.73	2.78	1.13	2.13	1.68	3.13	3.04	0.79	1.17	1.4	1.15	1.57	1.53
Gd	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Tb	0.59	0.47	1.19	0.69	1.05	0.68	1.44	1.87	0.56	0.79	1.03	0.99	1.17	1.68
Dy	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Tm	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Yb	2.29	1.52	2.57	1.87	3.11	1.85	3.65	3.32	1.62	2.26	2.73	3.76	3.11	5.21
Lu	0.27	0.19	0.32	0.2	0.38	0.21	0.46	0.51	0.22	0.36	0.41	0.44	0.44	0.77
Hf	1.81	0.59	5.24	1.45	2.01	3.65	3.19	5.22	1.17	1.81	3.79	3.2	3.22	4.25
Ta	0.67	0.35	0.63	0.68	1.03	0.9	1.02	1.52	0.35	0.7	0.72	0.44	0.86	1.19
Th	1.22	0.72	1.41	0.89	1.94	1.12	2.2	0.56	0.42	0.79	4.26	1.24	2.57	3.22

*Major elements are normalized to 100 percent, anhydrous and CO_2 free; † = below limit of detection; n.d. = not determined; LOI = loss on ignition.

SAMPLE DATA FOR TABLE 1

Sample Number	Collection Number	Rock Type	Location		
			Quadrangle	Latitude	Longitude
1	AB81-53E	Actinolite metagabbro	Flambeau R	64°41'14"	65°07'56"
2	AB81-145A	Eclogite	Nome	64°35'10"	65°08'06"
3	AB81-203	Glaucophane-actinolite metagabbro	Council	65°57'35"	63°57'10"
4	AB80-117-1	Glaucophane metagabbro	American R	65°32'10"	65°34'00"
5	AB80-135-1	Glaucophane-actinolite metagabbro	Kougarok R	65°35'47"	64°56'04"
6	AB80-118-2	Glaucophane metagabbro	American R	65°31'57"	65°34'15"
7	AB80-145-4	Actinolite metagabbro	Teller	65°10'50"	66°17'23"
8	AB81-212	Actinolite metagabbro	Council	64°43'15"	64°04'20"
9	AB81-127A	Glaucophane-actinolite metagabbro	Council	64°51'20"	63°54'10"
10	AB80-21-1	Actinolite metagabbro	Kougarok R	65°31'30"	64°48'54"
11	AB81-80G	Actinolite greenschist, layer in Cape Nome metagranite	Kougarok R	64°26'12"	65°00'24"
12	AB80-138-2	Glaucophane-actinolite metagabbro	Kougarok R	65°33'11"	64°49'20"
13	AB80-153-2	Actinolite greenschist	Teller	65°01'12"	66°08'58"
14	AB81-22	Actinolite greenschist	Nome	64°33'01"	65°19'40"

TABLE 2. ANALYSES OF BASALT, DIABASE, TUFF, AND GABBRO FROM ANGAYUCHAM TERRANE, NORTHERN ALASKA*

	Western Angayucham Terrane		Eastern Angayucham Terrane											
Sample	Trb	Jb	26	22	24	18	19	7	12A	22A	14	975	27	972
Body	...	...	Pluton	Sill	Sill	Sill	Flow	Flow	Sill	Sill	Plug	Pluton	Pluton	Pluton
SiO_2	49.9	49.8	48.2	49.1	49.5	49.5	49.5	49.7	50.3	50.3	50.9	51.5	52	53.3
Al_2O_3	14.1	13.7	13.1	14.8	14.2	12.6	14.7	14.6	15.8	14.6	15	15.3	15.3	15.3
TiO_2	1.6	2.8	3.43	1.78	1.75	3.79	1.61	1.47	1.2	1.47	1.67	1.65	1.78	1.82
Fe_2O_3	2.7	3.4	2.26	1.89	8.91	2.85	4.2	4.39	1.81	1.76	1.81	1.45	1.31	3.07
FeO	9.9	10.7	12.2	10.3	5.34	13.1	8.51	7.58	7.66	9.46	9.15	9.23	9.52	8.08
MgO	7.3	6.4	5.77	7.66	6.05	5.31	7.46	7.23	7.5	7.49	8.28	6.97	6.18	5.7
CaO	11	9.1	11.5	11.4	9.24	7.87	10.8	11.5	12.1	11.9	10.1	10	9.89	7.93
Na_2O	2.6	2.8	2.74	2.6	4.08	4	2.5	2.74	2.85	2.33	2.48	2.78	3.21	3.22
K_2O	0.5	0.6	0.17	0.25	0.4	0.07	0.44	0.5	0.41	0.43	0.33	0.73	0.47	1.13
P_2O_5	0.14	0.3	0.34	0.17	0.2	0.6	0.16	0.12	0.12	0.12	0.15	0.2	0.21	0.25
MnO	0.21	0.22	0.2	0.21	0.33	0.26	0.2	0.18	0.2	0.2	0.16	0.18	0.18	0.22
H_2O^+	2.89	3.39	1.6	2.89	2.89	3.44	2.62	1.98	2.22	2.25	3.4	1.49	1.25	3.08
H_2O^-	0.16	0.25	0.21	0.3	0.31	0.25	0.34	0.23	0.17	0.15	0.21	0.13	0.09	0.2
CO_2	0.13	0.17	0.22	0.03	0.03	0.13	0.17	0.15	0.7	0.03	0.05	0.1	0.06	0.17
Sc	46	38	39	48	49	44	49	43	47	48	46	32	33	30
Cr	203	124	70	305	195	21	287	351	405	65	378	11	122	155
Co	46	43	53	54	52	49	53	53	51	50	56	40	44	48
Ni	80	64	55	104	98	34	94	105	114	71	99	20	64	93
Cu	n.d.	n.d.	112	192	226	385	230	196	323	195	282	10	27	104
Rb	.10	13	25	6	18	2	8	11	7	9	7	29	22	19
Sr	135	266	139	231	180	145	186	198	203	218	163	279	259	250
Y	22	31	35	29	33	54	29	26	22	24	26	28	31	29
Zr	88	178	214	106	105	238	99	84	69	84	94	124	152	146
Nb	n.d.	n.d.	23	11	10	27	10	7	7	7	10	12	15	16
Ba	214	814	45	779	97	477	451	59	192	451	229	1800	1100	1900
La	4.9	16.3	12.7	5.1	4.8	17.5	3.9	3.4	3.1	3.8	4.3	11.3	12.1	13.2
Ce	12.5	38.4	32	13.2	12.8	44	14.6	10.1	7.4	5.9	12.5	26	27	30
Nd	9.6	23.3	19.3	12.1	9.9	28	10.2	8.1	6	8.3	9.9	15.1	17.9	18.4
Sm	3.3	6.3	5.1	3.1	3.2	6.5	2.9	2.5	1.9	2.7	2.9	3.9	4.4	4.7
Eu	1.3	2.1	2	1.4	1.4	2.5	1.2	0.97	0.59	1.3	1.3	1.4	1.5	1.7
Gd	4.3	6.9	n.d.	n.d.	n.d.	8.5	n.d.	3.4	2.7	n.d.	3.4	n.d.	n.d.	n.d.
Tb	0.75	1.1	0.93	0.62	0.82	1.4	0.63	0.57	0.5	0.63	0.58	0.69	0.77	0.85
Tm	0.46	0.59	n.d.	n.d.	n.d.	0.77	n.d.	0.37	0.35	n.d.	0.32	n.d.	n.d.	n.d.
Yb	2.9	3.6	2.7	2.4	3	4.8	2.6	2.2	2.2	2.2	1.9	2.2	2.4	2.2
Lu	0.43	0.53	0.43	0.34	0.45	0.71	0.38	0.32	0.32	0.31	0.27	0.29	0.36	0.39
Hf	2.3	4.7	4.32	2.21	2.51	5.04	2.29	1.77	1.53	2.07	2.19	2.91	3.36	3.53
Ta	0.35	1.35	1.08	0.41	0.31	1.43	0.29	0.24	0.29	0.27	0.34	0.61	0.65	0.76
Th	0.33	1.19	0.89	0.32	0.34	1.34	0.26	0.2	0.33	0.49	0.31	1.82	1.85	1.87

*Trb and Jb are averages of 12 Jurassic and 22 Triassic samples, respectively, from western Angayucham terrane (Pallister and Budahn, 1989), and all numbered samples are from eastern Angayucham terrane (Barker and others, 1988); n.d. = not determined. Locations of samples are given in the two cited references.

TABLE 3. MAJOR-ELEMENT ANALYSES OF DEVONIAN METAVOLCANIC ROCKS FROM THE JARVIS CREEK AND HAYES GLACIER SUBTERRANES OF THE SOUTHERN YUKON-TANANA TERRANE, EASTERN ALASKA RANGE*

Sample Number	Major and Minor Oxides														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Average
SiO_2	53.2	56.2	64	65.8	67.4	68.7	70	73.5	74.7	75.9	77	77.5	78.1	79.7	70.1
Al_2O_3	17.6	15	15.3	15.4	14.9	15.3	14.4	13.9	13.6	12.3	11.4	12.3	11.5	11.3	13.9
Fe_2O_3	2.78	6.76	2.01	2.22	4.64	0.92	1.58	1.01	1.31	2.27	2.82	0.62	0.51	1.51	2.21
FeO	7.78	4.35	5.67	3.39	0.57	2.64	2.44	1.05	0.32	0.35	0.28	0.54	1.03	0.05	2.18
MgO	4.09	2.76	1.89	3.33	0.2	1.1	1.11	0.61	0.37	0.3	0.23	0.5	0.91	1.08	1.31
CaO	3.86	5.45	6.13	6.21	1.72	4.5	2.85	1.12	0.02	0.2	0.3	0.96	1.02	0.53	2.49
Na_2O	4.52	6.93	0.26	2.03	4.67	2.69	2.3	2.93	2.68	3.93	4.51	2.57	0.41	4.12	3.18
K_2O	2.72	0.09	3.61	0.97	5.08	3.2	4.32	5.29	6.52	4.38	3.2	4.77	6.33	1.35	3.7
TiO_2	2.27	2.07	1.09	0.58	0.43	0.73	0.3	0.39	0.39	0.17	0.15	0.19	0.12	0.33	0.69
P_2O_5	0.95	0.39	0.09	0.07	0.05	0.2	0.11	0.08	0.05	0.05	0.05	0.05	0.05	0.05	0.16
MnO	0.19	0.08	0.09	0.07	0.31	0.03	0.06	0.02	0.02	0.04	0.06	0.02	0.02	2.04	0.22
H_2O^+	n.d.	1.09	n.d.	n.d	0.9	n.d.	n.d.	0.9	n.d.	0.44	0.33	n.d.	n.d.	n.d.	n.d.
H_2O^-	3.11	0.48	1.46	2.26	0.34	3.56	1.84	0.07	1.41	0.32	0.28	1.33	2.08	1.04	1.9
CO_2	n.d.	0.02	n.d	n.d.	1.36	n.d.	n.d.	0.01	n.d.	0.08	0.13	n.d.	n.d.	n.d.	n.d.

*Elements normalized to 100 percent, less H_2O and CO_2 or LOI (loss on ignition). Analysts: A. J. Bartel, J. S. Wahlberg, J. Taggart, J. Baker, E. Brandt, C. Mason, E. Engleman, P. Klock, and K. Stewart. n.d. = not determined.

SAMPLE DATA FOR TABLE 3

Sample Number	Collection Number	Lithology	Latitude	Longitude
1	81ANK166D	Metadacite	63°10'48"	144°14'12"
2	80ARM006A	Metaandesite	63°42'14"	146°47'51"
3	81ANK236C	Metarhyolite	63°19'27"	144°24'08"
4	82ANK031A	Metadacite	63°42'48"	146°44'31"
5	80AAF039A	Metarhyolite	63°41'00"	146°40'41"
6	80AAF040A	Metarhyolite	63°34'49"	145°51'50"
7	81ASB059C	Metarhyodacite	63°16'28"	144°04'39"
8	84ANK043A	Metarhyolite	63°40'58"	145°21'03"
9	81AIL163B	Metarhyolite	63°29'53"	144°07'46"
10	80AAF022A	Metaquartz latite porphyry	63°40'21"	146°33'30"
11	80AAF024A	Metaquartz latite porphyry	63°40'30"	146°32'18"
12	81ANK235A	Metarhyolite	63°15'56"	144°33'36"
13	79ANK159C	Metarhyolite	63°08'38"	144°19'38"
14	81ANK239A	Metarhyolite	63°15'32"	144°02'00"

TABLE 4. MAJOR- AND MINOR-ELEMENT ANALYSES OF ROCKS OF TETELNA AND STATION CREEK FORMATIONS, NABESNA AND MCCARTHY QUADRANGLES*

Sample Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14
SiO_2	49.1	49.5	50	50.5	51.1	51.4	51.9	52.1	52.1	53.1	53.3	54.3	54.5	54.7
Al_2O_3	13.7	17.2	14.9	14.1	20.8	19	17.5	18.8	17.4	17.1	16.8	17.5	18.5	18.4
Fe_2O_3	2.55	2.6	3.73	3.67	2.3	2.79	3.48	3.31	3.29	2.84	6.78	2.57	1.65	2.55
FeO	7.04	8.33	8.24	7.96	6.76	7.07	5.47	6.11	7.91	8.09	2.31	5.64	6.83	6.05
MgO	10.8	6.29	6.96	7.44	3.71	5.24	6.17	5.19	5.84	5.04	4.75	4.38	4.94	4.3
CaO	10.2	7.42	9.7	9.73	8.31	9.55	8.84	9.33	5.58	6.1	7.46	10.34	7.26	6.85
Na_2O	2.03	3.74	3.31	3.95	3.79	2.31	3.46	2.54	5.17	5.03	4.69	3.86	3.19	4.07
K_2O	2.98	2.15	0.98	0.16	1.94	1.13	1.88	1.14	1.17	0.95	1.85	0.26	1.7	2.02
TiO_2	0.92	1.98	1.8	2.08	0.92	1.03	0.8	1.07	1.05	1.14	1.44	0.79	0.9	0.66
P_2O_5	0.46	0.65	0.19	0.22	0.12	0.29	0.18	0.29	0.25	0.33	0.25	0.19	0.3	0.26
MnO	0.16	0.15	0.21	0.2	0.19	0.19	0.26	0.18	0.16	0.23	0.13	0.16	0.19	0.2
H_2O^+	3.68	3.78	2.63	2.85	3.37	3.43	2.41	3.29	3.59	3.02	2.38	3.42	3.31	3.07
H_2O^-	0.73	0.54	0.13	0.11	0.14	0.35	0.33	0.22	0.38	0.18	0.33	0.13	0.3	0.24
CO_2	0.3	0.55	0.09	0.14	0.14	2.7	0.62	2.9	0.7	0.67	2.44	1.92	1.78	0.15
Sc	39	28	56	49	43	35	39	36	45	47	27	40	30	28
Cr	463	125	127	326	13	n.d.	n.d.	n.d.	68	19	55	32	n.d.	n.d.
Co	42	35	n.d.	n.d.	n.d.	32	32	19	43	n.d.	26	n.d.	29	22
Ni	114	53	63	80	17	17	12	18	20	14	21	20	22	14
Cu	n.d.	n.d.	n.d.	n.d.	n.d.	183	<1	208	n.d.	n.d.	n.d.	n.d.	170	101
Rb	64	48	25	<5	43	29	61	28	25	21	43	<5	32	28
Sr	240	740	290	86	475	480	560	485	370	413	270	29	546	256
Y	15	35	31	32	13	20	19	21	32	24	12	19	18	22
Zr	127	182	290	141	49	62	65	69	82	68	49	65	69	72
Nb	n.d.	n.d.	7	13	<5	<10	<10	<10	n.d.	7	n.d.	<5	<10	<10
Ba	660	920	<92	35	982	369	722	410	620	519	860	77	494	1320
La	17	29	6.1	9	3	8.1	12	8.3	24	11	19	6.7	10	11
Ce	39	63	15	22	7.1	17	23	18	50	21	37	14	19	24
Nd	21	37	11	15	6.2	12	14	12	26	12	22	8.6	12	15
Sm	5.1	7.4	3.9	4.8	2	3.4	3.2	3.4	5.9	3.6	4.8	2.6	3.4	4.2
Eu	1.4	2.2	1.3	1.6	0.71	0.97	0.89	1	1.8	1.2	1.4	0.79	1	1.1
Gd	5.6	6.4	5.1	5	2.3	3.4	3.2	3.6	6.1	3.5	n.d.	2.6	3.5	4.2
Tb	0.71	1.1	0.92	0.92	0.43	0.51	0.49	0.54	n.d.	0.61	1.1	0.47	0.51	0.61
Dy	4.2	6.5	5.4	5.3	2.6	3.2	3.3	3.7	5.3	3.9	5.6	2.7	3.3	3.9
Tm	0.33	n.d.	0.43	0.33	0.22	0.3	0.3	0.32	n.d.	0.27	n.d.	0.25	0.3	0.34
Yb	1.6	3	2.4	1.7	1.3	2	1.9	2	2.5	1.7	3.7	1.5	1.9	2.1
Lu	0.24	0.48	0.33	0.24	0.2	0.29	0.29	0.31	0.41	0.26	0.57	0.23	0.28	0.31
Hf	3.4	4.2	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	2.3	n.d.	5	n.d.	n.d.	n.d.
Ta	0.45	1.06	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	0.25	n.d.	0.8	n.d.	n.d.	n.d.
Th	3	2.6	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.2	n.d.	2.7	n.d.	n.d.	n.d.
U	1.9	1.5	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	2.2	n.d.	1.4	n.d.	n.d.	n.d.

*Major elements are normalized to 100 percent, less H_2O and CO_2. Analysts: A. Bartel, L. Espos, P. Klock, V. McDaniel, S. Neil, J. Riviello, J. Taggart, J. Budahan, D. Burgi, R. Johnson, R. Knight, M. Malcolm, and J. L. Seeley; n.d. = not determined

†For basalt only (49.1 to 52.1 percent SiO_2).

TABLE 4. CONTINUED

15	16	17	18	19	20	21	22	23	24	25	26	27	28	Average†
55.1	55.6	56	57.2	57.4	57.9	59.9	61.9	62.6	63.4	64.1	64.2	65.7	71.5	50.9
18.2	18	18.1	14.3	18.6	18.6	17.2	17.4	15.9	16.1	18	16.8	16.6	14.6	17
3.54	2.26	1.66	3.57	2.98	3.59	1.99	0.81	3.11	2.83	4.27	0.54	2.01	0.81	3.08
5.75	5.63	7.11	3.24	5.79	2.9	4.72	5.81	3.18	7.87	0.89	4.91	1.94	2.56	7.21
5.74	4.48	5.71	2.77	3.6	3.84	5.42	3	2.25	2.7	1.64	1.81	2.44	1.07	6.4
4.75	6.88	5.08	9.86	2.86	6.08	2.64	3.26	5.76	3.07	2.28	2.06	4.38	1.76	8.74
4.78	5.41	3.21	5.72	7.15	3.93	3.84	5.77	5.06	0.47	3.41	5.17	4.77	4.89	3.37
0.48	0.64	1.96	0.89	0.38	1.99	4.17	1.22	1.33	2.61	4.47	3.34	1.39	2.2	1.5
0.9	0.78	0.8	1.37	0.81	0.56	0.82	0.58	0.51	0.67	0.66	0.77	0.47	0.41	1.29
0.2	0.21	0.16	0.44	0.23	0.39	0.16	0.15	0.12	0.12	0.19	0.23	0.18	0.11	0.29
0.23	0.1	0.18	0.14	0.18	0.19	0.07	0.14	0.16	0.14	0.07	0.14	0.08	0.09	0.19
3.37	3.05	3.2	1.23	2.77	2.33	3.27	2.44	1.73	4.23	1.86	1.79	1.79	1.17	3.22
0.7	0.29	0.21	0.34	0.24	0.4	0.27	0.15	0.18	0.37	0.22	0.1	0.81	0.11	0.33
1.51	0.29	0.16	5.39	1.63	1.89	0.59	1.41	3.42	1.88	0.6	1.14	2.18	0.15	0.9
26	21	40	23	25	9	24	21	31	31	15	22	8	9	41
n.d.	77	35	110	n.d.	n.d.	8	2	n.d.	n.d.	n.d.	3	n.d.	n.d.	187
24	20	n.d.	23	21	16	18	n.d.	20	37	12	n.d.	13	6	34
10	26	21	41	3	4	4	5	17	7	3	5	36	2	44
<1	n.d.	n.d.	n.d.	5	26	n.d.	n.d.	8	<1	9	n.d.	29	35	190
22	10	38	14	8	52	52	26	33	62	135	46	45	33	36
626	265	425	265	343	751	183	319	365	54	416	123	624	229	414
29	45	18	26	24	18	26	20	21	27	32	24	16	24	24
81	215	65	120	81	116	68	81	82	84	212	124	117	156	118
<10	n.d.	<5	n.d.	<10	<10	n.d.	6	<10	11	<10	7	10	<10	<10
435	300	623	495	435	1330	3250	480	585	1770	1380	777	939	1240	534
8.4	29	8.4	15	13	24	8.6	11	9	6.8	21	12	13	13	13
19.6	56	16	34	27	46	21	23	18	13	44	24	26	26	26
12.3	28	9.4	22	17	24	13	12	11	8.8	23	13	13	14	17
3.6	5.7	2.9	4.8	3.6	5.1	3.1	3.4	2.7	2.3	5.4	3.8	2.8	3.5	4.3
0.93	1.3	0.83	1.5	1.2	1.3	1	0.86	0.68	0.6	1.2	0.95	0.71	0.76	1.3
3.8	n.d.	2.4	n.d.	4	4.1	3.9	2.6	2.8	2.2	5.4	3.3	2.1	3.5	4.5
0.59	1	0.38	0.8	0.56	0.53	n.d.	0.46	0.47	0.42	0.74	0.55	0.3	0.51	0.7
3.7	5.9	2.7	4.2	4.1	3.4	4.2	3.3	3.2	2.5	5.1	3.9	1.8	3.2	4.4
0.34	n.d.	0.22	n.d.	0.36	0.36	n.d.	0.25	0.32	n.d.	0.42	0.4	0.15	0.34	0.32
2.1	3.4	1.4	2.2	2.3	2	2.7	1.9	2.1	1.7	2.6	2.7	0.97	2.2	2
0.31	0.51	0.19	0.36	0.38	0.33	0.38	0.28	0.33	0.25	0.39	0.4	0.15	0.34	0.31
n.d.	5	n.d.	2.5	n.d.	n.d.	1.9	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	3.3
n.d.	1.4	n.d.	0.47	n.d.	n.d.	0.12	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	0.58
n.d.	6.4	n.d.	1.3	n.d.	n.d.	1.8	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	3.3
n.d.	2.5	n.d.	0.7	n.d.	n.d.	1.8	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	1.9

SAMPLE DATA FOR TABLE 4

Sample Number	Collection Number	Type of Deposit	Elevation (ft)	Location
1	AK-810	Flow or dike	5,650	Basin northwest of tributary to Hawkins Glacier, McCarthy A-3 quadrangle, NW1/4,S2,T8S,R19E.
2	AK-801	Flow	4,200	South of Chitistone Glacier, McCarthy C-4 quadrangle, SW1/4,S15,T4S.,R18E.
3	81-14	Flow	6,000	1.5 mi north of Mush Lake, Dezadeash 1:250,000 sheet, Yukon Territory.
4	81-16	Flow	2,600	Southeast Kluane Lake, roadcut, Alaska Highway near triangulation station 2636, Kluane Lake 1:250,000 sheet.
5	81-28	Flow or sill	3,200	East end Indian Pass Lake, Nabesna D-6 quadrangle, NW1/4,S16,T12N,R8E.
6	82-34	Flow	5,580	Ridge north of Indian Pass Lake, Nabesna D-6 quadrangle, NE1/4,S8, T12N,R8E.
7	82-41	Dike(?)	4,750	Ridge northwest of Kennedy Lake, Gulkana D-1 quadrangle, SE1/4,S36, T12N,R7E.
8	82-35	Flow	5,580	Ridge north of Indian Pass Lake, Nabesna D-6 quadrangle, NE1/4,S8, T12N,R8E.
9	AK-807	Tuff	5,800	Southeast side glacier of Canyon Creek, McCarthy Creek, B-3 quadrangle, Boundaries R5 and R6, T7S,R19E.
10	81-29	Flow	3,200	East end Indian Pass Lake, Nabesna D-6 quadrangle, NW1/4,S16,T12N,R8E.
11	AK-813	Flow	3,580	North of Chitistone Glacier, McCarthy C-4 quadrangle, SW1/4,S9,T4S,R18E.
12	81-31	Flow	3,600	3/8 mi east of Indian Pass Lake, Nabesna D-6 quadrangle, SW1/4,S16, T12N,R8E.
13	82-33	Flow or sill	5,900	Ridge north Indian Pass Lake, Nabesna D-6 quadrangle, NE1/4,S8,T12N,R8E.
14	82-16	Flow	4,550	North of Baultoff Creek, Nabesna A-1 quadrangle, NW1/4,S28,T4N,R23E.
15	82-12	Flow	5,400	North side Middle Fork White River, McCarthy D-3 quadrangle, SW1/4,S30, T1S,R20E.
16	AK-811	Tuff	6,100	Basin northwest and tributary to Hawkins Glacier, McCarthy A-3 quadrangle, NE1/4,S2,T8N,R19E.
17	81-43	Flow or sill	3,550	Boyden Creek, Nebesna B-5 quadrangle, SW1/4,S7,T8N,R13E.
18	AK-814	Pillow lava	4,650	North of Chitistone Glacier, McCarthy C-4 quadrangle, SW1/4,S10,T4S,R18E.
19	82-42	Flow	4,550	Ridge northwest of Kennedy Lake, Gulkana D-1 quadrangle, NE1/4,S1, T11N,R7E.
20	82-44	Flow	5,900	400 ft southwest of Summit of Peak 6010, Nabesna D-6 quadrangle, SE1/4,S21,T12N,R8E.
21	AK-806	Flow(?)	5,400	Northeast side glacier of Canyon Creek, McCarthy B-3 quadrangle, NW1/4,S6, T7S,R19E.
22	81-41	Sill	3,750	Boyden Creek, Nabesna B-5 quadrangle, SE1/4,S7,T8N,R13E.
23	82-40	Flow	4,750	Ridge northwest of Kennedy Lake, Gulkana D-1 quadrangle, SE1/4,S36, T12N,R7E.
24	82-19	Flow	4,000	Nikonda Creek, Nabesna A-4 quadrangle, NW1/4,S12,T4N,R14E.
25	82-46	Flow	4,620	750 ft northwest of Summit of Suslota Mountain, Nabesna D-6 quadrangle, SW1/4,S34,T12N,R9E.
26	81-44	Flow or sill	3,350	(Lower) Boyden Creek, Nabesna B-5 quadrangle, SE1/4,S12,T8N,R12E.
27	82-20	Sill	4,000	Nikonda Creek, Nabesna A-4 quadrangle, NW1/4,S12,T4N,R14E.
28	82-23	Flow or sill	4,460	Boyden Creek, Nabesna B-5 quadrangle, SW1/4,S9,T8N,R13E.

TABLE 5. MAJOR- AND MINOR-ELEMENT ANALYSES OF VOLCANIC ROCKS FROM THE PENNSYLVANIAN TETELNA VOLCANICS AND PENNSYLVANIAN AND PERMIAN SLANA SPUR FORMATION IN THE SLANA RIVER SUBTERRANE OF THE WRANGELLIA TERRANE, EASTERN ALASKA RANGE*

Sample Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
SiO_2	47.5	55.6	55.7	56	59.3	59.5	61	63.6	64.3	65.4	70.3	73.5	74.3	74.5	76.8	78.3
Al_2O_3	16.6	18.9	20.8	18.6	19.1	16.8	18.5	15.6	14.8	15.7	14.3	11.4	13.8	14.4	12.9	11.7
Fe_2O_3	3.82	5.72	3.25	2.34	1.36	2.95	1.24	1.56	5.47	3.55	3.65	2.92	1.15	1.11	2.55	0.62
FeO	7.85	4.07	4.74	5.59	4.22	6.34	4.4	4.25	2.02	2.92	1.02	3.64	2.03	0.83	0.11	0.57
MgO	10.4	3.35	6.48	3.48	2.35	7.93	2.38	3.93	2.99	4.89	3.27	2.83	1.54	0.64	0.31	0.57
CaO	9.98	4.31	3.6	7.4	4.7	1.14	3.74	5.15	6.3	0.9	0.68	2.24	1.28	3.57	3.14	2.01
Na_2O	2.47	6.39	4.21	3.06	5.66	3.69	5.81	4.17	3.5	4.84	3.48	0.74	4.35	3.54	2.36	2.05
K_2O	0.14	0.43	0.[illegible]	2.13	2.11	0.36	1.68	0.86	0.08	1.16	2.78	1.99	1.12	1.03	1.53	3.85
TiO_2	0.83	0.8	0.67	0.65	0.8	0.93	0.79	0.53	0.44	0.5	0.39	0.36	0.27	0.29	0.2	0.22
P_2O_5	0.09	0.23	0.13	0.52	0.35	0.23	0.35	0.11	0.05	0.07	0.08	0.25	0.06	0.06	0.05	0.05
MnO	0.09	0.23	0.13	0.52	0.35	0.23	0.35	0.11	0.05	0.07	0.08	0.25	0.06	0.06	0.05	0.05
H_2O^+	3.87	3.75	5.23	3.46	2.31	3.73	2.3	2.95	3.05	2.79	2.21	3.12	1.88	2.68	2.64	1.25
H_2O^-	0.77	0.64	0.79	0.28	0.3	0.3	0.34	0.34	0.3	0.29	0.52	0.54	0.21	0.39	0.44	0.15
CO_2	1.35	3.12	2.28	0.01	0.98	1.18	2.52	3.04	0.01	0.45	0.01	1.57	0.67	0.06	2.1	0.48
Sc	45	32	33	n.d.	18	31	n.d.	27	29	31	19	n.d.	11	12	11	n.d.
Cr	666	64	25	n.d.	20	2	n.d.	12	18	36	5	n.d.	4	4	3	n.d.
Rb	7	10	11	n.d.	58	7	n.d.	23	4	16	33	n.d.	29	28	35	n.d.
Sr	226	254	110	n.d.	231	52	n.d.	252	257	71	98	n.d.	136	343	148	n.d.
Y	22	23	23	n.d.	27	[illegible]	n.d.	22	16	21	25	n.d.	21	16	27	n.d.
Zr	47	113	81	n.d.	231	69	n.d.	84	66	77	97	n.d.	97	69	113	n.d.
Nb	8	9	11	n.d.	10	7	n.d.	8	5	7	5	n.d.	8	5	6	n.d.
Ba	96	198	280	n.d.	1660	74	n.d.	316	307	470	1800	n.d.	380	272	1000	n.d.
La	3.74	31.6	9.65	n.d.	69.7	4.46	n.d.	9	8.56	6.38	11.1	n.d.	13.9	12	14.8	n.d.
Ce	0	69.2	20.8	n.d.	134	10.3	n.d.	17.9	16.3	12.7	24	n.d.	29.8	22.5	30.4	n.d.
Nd	7.59	33.4	11.5	n.d.	60.6	7.14	n.d.	10.1	8.78	8	14.4	n.d.	16.9	10.9	16.4	n.d.
Sm	2.41	6.63	2.98	n.d.	10.1	2.37	n.d.	2.52	2.43	2.05	3.89	n.d.	3.28	2.45	3.6	n.d.
Eu	1.01	1.81	1.01	n.d.	2.39	0.8	n.d.	0.65	0.75	0.52	1.06	n.d.	1.07	0.94	0.78	n.d.
Tb	0.63	0.86	0.55	n.d.	1.08	0.5	n.d.	0.47	0.41	0.36	0.71	n.d.	0.5	0.4	0.49	n.d.
Tm	0.39	0.46	0.39	n.d.	0.44	0.33	n.d.	0.36	0.2	0.25	0	n.d.	0.34	0.29	0.44	n.d.
Yb	2.38	2.74	2.21	n.d.	2.72	1.97	n.d.	2.34	1.18	1.65	2.89	n.d.	2.26	1.96	2.97	n.d.

*Major elements are normalized to 100 percent, less H_2O and CO_2; n.d. = not determined. Analysts: J. Baker, H. Neiman, F. Newman, J. Taggart, J. S. Wahlberg, P. Briggs, D. Burgi, R. Johnson, B. Keaten.

SAMPLE DATA FOR TABLE 5

Sample Number	Collection Number	Lithology	Latitude	Longitude	Sample Number	Collection Number	Lithology	Latitude	Longitude
1	79AHZ072B	Basalt dike	63°01'07"	144°21'17"	9	79AHZ073B	Dacite porphyry breccia	63°00'58"	144°21'14"
2	79AHZ075E	Dacite porphyry tuff	63°02'23"	144°22'23"	10	79AHZ117A	Andesite to basalt porphyry	63°00'57"	144°16'33"
3	79AHZ115B	Andesite to basalt porphyry	63°01'25"	144°16'50"	11	79AHZ073C	Basalt porphyry	63°00'58"	144°21'14"
4	79AHZ067C	Andesite porphyry tuff	63°01'54"	144°21'26"	12	79AHZ067D	Andesite tuff	63°01'54"	144°21'26"
5	79AHZ071C	Andesite porphyry dike	63°01'50"	144°21'26"	13	79AHZ072K	Dacite porphyry	63°01'07"	144°21'17"
6	79AHZ118B	Andesite porphyry	63°00'50"	144°16'25"	14	79AHZ074C	Dacite porphyry crystal tuff	63°01'05"	144°21'36"
7	79AHZ067E	Andesite to basalt porphyry	63°01'54"	144°21'26"	15	79AHZ075F	Dacite porphyry tuff	63°02'23"	144°22'23"
8	79AHZ115A	Andesite to basalt porphyry	63°01'25"	144°16'50"	16	79AHZ070A	Dacite porphyry crystal tuff	63°01'23"	144°21'41"

TABLE 6. MAJOR- AND MINOR-ELEMENT ANALYSES OF STRELNA METAMORPHICS AND PROBABLE CORRELATIVES, SOUTHERN ALASKA*

	Strelna Metamorphics Valdez Quadrangle (VA)		Strelna Metamorphics Yakutat Area (YA)	
Sample Number	1	2	3	4
SiO_2	50.15	52.09	48.8	54.3
Al_2O_3	15.32	13.97	18	17.5
Fe_2O_3	2.1	8.11	2.69	2.57
FeO	9.25	4.82	5.52	5.49
MgO	8.7	5.32	8.25	5.65
CaO	8.81	7.17	10.9	7.17
Na_2O	3.54	5.26	3.51	4.63
K_2O	0.27	0.99	0.58	0.78
TiO_2	1.51	1.88	1.39	1.41
P_2O_5	0.14	0.21	0.17	0.43
MnO	0.22	0.2	0.14	0.14
H_2O^+	3.91	1.65	1.92	1.26
H_2O^-	0.18	0.09	0.01	0.06
CO_2	0.37	0.92	0.01	0.04
Sc	51	44	29	16
Cr	292	50	200	150
Co	40	41	n.d.	25
Ni	82	45	99	74
Cu	80	68	n.d.	n.d.

	Strelna Metamorphics Valdez Quadrangle (VA)		Strelna Metamorphics Yakutat Area (YA)	
Sample Number	1	2	3	4
Rb	14	33	8	20
Sr	20	162	323	611
Y	20	34	20	19
Zr	72	100	107	217
Nb	<10	<10	<5	28
Ba	170	210	59	331
La	2.7	3.6	5.3	31
Ce	8.1	12.9	14	64
Nd	7.6	11.5	11	31
Sm	2.7	4.6	3.7	6.3
Eu	1	1.4	1.1	1.6
Gd	4.2	6	4.5	5.4
Tb	0.82	1.06	0.79	0.75
Tm	0.54	0.65	0.38	0.42
Yb	3.2	4	2	2.5
Lu	0.47	0.6	0.3	0.37
Hf	2.2	3	n.d.	5
Ta	0.13	0.18	n.d.	2
Th	0.21	0.09	n.d.	3.8
U	0.14	0.45	n.d.	1.1

*Major elements are normalized to 100 percent, less H_2O and CO_2; n.d. = not determined. Analysts: G. Kawakita, J. S. Wahlberg, J. Taggart, J. Baker, K. McKowen, R. W. Knight, P. A. Baedecker, V. McDaniel, and R. Johnson.

SAMPLE DATA FOR TABLE 6

Sample Number	Collection Number	Lithology	Quadrangle	Latitude	Longitude
1	84APr213	Chloritic metabasalt breccia	VA B-1	61°18'18"	144°15'20"
2	84ANK155	Tremolite greenschist	VA B-3	61°28'30"	144°54'00"
3	80APr38B	Amphibolite	YA D-3	59°50'00"	138°49'00"
4	78APr-14B	Amphibolite	YA D-3	59°47'42"	138°42'06"

TABLE 7. MAJOR- AND MINOR-ELEMENT ANALYSES OF NIKOLAI GREENSTONE, MCCARTHY, AND NEBESNA QUADRANGLES, SOUTHERN ALASKA*

Sample Number	1	2	3	4	5	6	7	8	9	Average
SiO_2	47.4	49.1	49.1	50.1	50.6	50.7	50.8	50.9	51.1	50
Al_2O_3	15.8	16.9	14.7	14.8	15.3	18	15.8	15.5	14.3	15.7
Fe_2O_3	10.6	5.31	4.89	6.16	2.55	2.35	3.72	3.07	2.19	4.54
FeO	3.99	7.73	8.17	6.05	9.47	8.17	10	7.12	8.68	7.71
MgO	6.22	7.55	6.69	6.63	6.63	6.89	3.79	9.76	6.37	6.73
CaO	8.59	7.6	10.5	9.58	8.59	8.81	9.64	8.68	12.1	9.34
Na_2O	4.32	2.31	3.3	3.99	3.62	3.42	3.23	3.65	2.77	3.4
K_2O	1.03	1.35	0.43	0.63	1.03	0.66	0.33	0.45	0.34	0.69
TiO_2	1.72	1.8	1.9	1.8	1.83	0.74	2.27	0.59	1.7	1.59
P_2O_5	0.12	0.15	0.16	0.16	0.16	0.09	0.25	0.06	0.19	0.15
MnO	0.14	0.21	0.24	0.16	0.25	0.19	0.17	0.19	0.19	0.19
H_2O^+	2.43	3.07	2.46	3.18	3	4.38	3.17	3.46	0.91	2.86
H_2O^-	0.57	0.24	0.34	0.55	0.15	0.73	0.35	0.33	0.22	0.39
CO_2	2.43	0.15	0.48	0.02	0.08	3.8	0.31	0.04	0.04	0.82
Sc	39	38	41	42	51	38	28	49	43	41
Cr	n.d.	n.d.	n.d.	n.d.	119	n.d.	5	n.d.	73	66
Co	63	50	49	49	n.d.	48	37	58	37	49
Ni	105	101	68	94	67	36	22	168	58	78
Cu	58	73	34	139	n.d.	105	n.d.	137	n.d.	91
Rb	19	33	10	12	n.d.	18	<10	9	12	<16
Sr	584	612	318	276	n.d.	414	245	253	192	362
Y	89	30	29	33	n.d.	18	32	21	15	33
Zr	23	113	120	112	n.d.	63	131	39	105	88
Nb	<10	10	<10	<10	n.d.	<10	n.d.	<10	n.d.	<10
Ba	314	357	318	236	n.d.	496	114	157	84	260
La	4.3	6.6	8.8	8	7.2	4.4	9.8	1.4	8	6.5
Ce	9.9	17	20	20	18	11	23	3.5	18	16
Nd	9.8	13	15	14	12	7.8	17	3.1	13	12
Sm	3.3	4.1	4.4	4.2	3.7	2.3	4.2	1.4	3.7	3.5
Eu	0.97	1.2	1.2	1.2	1.3	0.57	1.8	0.45	1.4	1.1
Gd	3.9	5	4.9	4.8	4.2	2.4	n.d.	1.8	n.d.	3.9
Tb	0.61	0.75	0.79	0.75	0.73	0.4	0.88	0.35	0.89	0.68
Dy	3.9	4.6	4.7	4.8	4.3	2.5	4.6	2.6	4.5	4.1
Tm	0.25	0.32	0.39	0.39	0.37	0.21	n.d.	0.27	0.38	0.32
Yb	1.6	2.1	2.2	2.4	2.3	1.3	2.6	1.7	2.3	2
Lu	0.23	0.29	0.29	0.37	0.39	0.2	0.4	0.26	0.35	31
Hf	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	3.3	n.d.	2.5	2.9
Ta	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	0.69	n.d.	0.56	0.62
Th	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	0.9	n.d.	0.8	0.8
U	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	0.4	n.d.	0.6	0.5

*Major elements are normalized to 100 percent, less H_2O and CO_2; n.d. = not determined. Analysts: A. Bartel, L. Espos, P. Klock, V. McDaniel, S. Neil, J. Riviello, J. Taggart, J. Budahn, D. Burgi, R. Johnson, R. Knight M. Malcolm, and J. L. Seeley

SAMPLE DATA FOR TABLE 7

Sample Number	Collection Number	Type of Deposit	Elevation (ft)	Location
1	82-24	Flow	7,200	Ridge east of Trail Creek, NW1/4,S5,T9N,R12E.
2	82-17	Flow	4,700	Ridge south of Fourmile Creek, NW1/4,S19,T4N,R24E.
3	82-21	Flow	3,600	West of Nabesna Glacier, NW1/4,S19,T4S,R13E.
4	82-9	Flow	6,100	Ridge southeast of Chisana Glacier, NE1/4,S35,T3N,R17E.
5	81-13	Flow	3,700	4.5 km northeast of Mush Lake, Yukon Territory, Canada.
6	82-10	Plug	4,100	South bank, Middle Fork of White River, NE1/4,S32,T1S, R20E.
7	AK-804	Dike	7,100	Ridge south of Chitistone Glacier, SE1/4,S21,T4S,R18E.
8	82-25	Flow	5,750	Spur east of Trail Creek, SE1/4, S6,T9N,R12E.
9	AK-805	Dike	5,700	Northwest side of Canyon Creek Glacier, SE1/4,S31,T7S, R19E.

TABLE 8. MAJOR AND MINOR OXIDES, AND TRACE ELEMENT CHEMICAL ANALYSES OF BASALT FROM THE LATE TRIASSIC NIKOLA GREENSTONE AND COMAGMATIC GABBRO DIKES IN THE TANGLE SUBTERRANE OF THE WRANGELLIA TERRANE, EASTERN ALASKA RANGE*

Sample Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
SiO_2	47.6	47.9	48.5	49.1	49.2	49.2	49.4	49.4	49.6	49.9	50	50	50.1	50.5	50.9	51.5	51.7	51.9
Al_2O_3	15.4	18.5	15.3	14.5	15.7	14.1	14.3	15.1	14.6	14.9	15.3	13.2	16	14.6	17.3	16.9	14.3	14.2
Fe_2O_3	5.57	2.31	2.19	5.46	1.43	3.73	4.96	4.25	4.18	4.14	6.24	6.05	1.84	1.96	1.2	1.14	1.94	7.62
FeO	7.53	9.79	8.96	7.49	9.52	10.4	8.34	8.06	8.6	7.27	6.07	8	8.99	9.8	9.18	5.89	9.21	4.02
MgO	7.58	7.46	8.42	6.63	8.5	5.98	6.59	6.63	6.65	7.45	6.14	5.94	8.12	7.25	8.62	9.22	7.22	6.61
CaO	11.3	9.39	13.2	11.2	12.7	10.4	10.6	11.5	11.2	11.8	10.4	11.3	10.4	10.9	7.84	12.3	9.48	10.9
Na_2O	2.39	3.28	2.24	2.41	1.73	3.06	2.23	2.38	2.24	2.39	2.58	2.25	3.37	2.56	2.71	2.14	3.89	2.93
K_2O	0.03	0.27	0.05	0.4	0.13	0.28	0.54	0.42	0.22	0.32	0.64	0.23	0.12	0.14	1.09	0.18	0.1	0.19
TiO_2	2.1	0.76	0.86	2.32	0.76	2.43	2.49	2.02	2.29	1.54	2.26	2.54	0.75	1.89	0.91	0.57	1.73	1.39
P_2O_5	0.19	0.11	0.09	0.22	0.08	0.25	0.22	0.18	0.22	0.13	0.23	0.23	0.09	0.16	0.1	0.07	0.18	0.11
MnO	0.21	0.2	0.21	0.19	0.2	0.18	0.21	0.19	0.19	0.18	0.18	0.21	0.19	0.2	0.18	0.15	0.2	0.24
LOI	3	3.48	2.8	1.32	2.22	1.94	1.87	1.46	0.86	2.01	2.04	0.77	3.3	1.82	3.05	2.11	2.24	2.13
Sc	n.d.	n.d.	n.d.	n.d.	42	n.d.	n.d.	n.d.	45	46	n.d.	47	n.d.	43	20	n.d.	n.d.	38
Cr	n.d.	n.d.	n.d.	n.d.	343	n.d.	n.d.	n.d.	189	283	n.d.	97	n.d.	134	418	n.d.	n.d.	277
Co	n.d.	n.d.	n.d.	n.d.	47.9	n.d.	n.d.	n.d.	43.8	43.9	n.d.	46	n.d.	44.2	42.4	n.d.	n.d.	38.5
Rb	n.d.	n.d.	n.d.	n.d.	2.5	n.d.	n.d.	n.d.	2.5	15	n.d.	2.5	n.d.	2.5	19	n.d.	n.d.	8.3
Sr	n.d.	n.d.	n.d.	n.d.	75	n.d.	n.d.	n.d.	180	185	n.d.	75	n.d.	250	180	n.d.	n.d.	218
Y	n.d.	n.d.	n.d.	n.d.	22	n.d.	n.d.	n.d.	30	22	n.d.	32	n.d.	24	20	n.d.	n.d.	21
Zr	n.d.	n.d.	n.d.	n.d.	64	n.d.	n.d.	n.d.	143	92	n.d.	152	n.d.	128	93.6	n.d.	n.d.	120
Nb	n.d.	n.d.	n.d.	n.d.	7	n.d.	n.d.	n.d.	15	11	n.d.	13	n.d.	11	5	n.d.	n.d.	9
Ba	n.d.	n.d.	n.d.	n.d.	68	n.d.	n.d.	n.d.	114	88	n.d.	101	n.d.	110	218	n.d.	n.d.	90.4
La	n.d.	n.d.	n.d.	n.d.	2.46	n.d.	n.d.	n.d.	11.3	6.87	n.d.	11.8	n.d.	8.19	3.67	n.d.	n.d.	6.32
Ce	n.d.	n.d.	n.d.	n.d.	5.1	n.d.	n.d.	n.d.	27.8	15.1	n.d.	30.5	n.d.	21.5	11	n.d.	n.d.	15.9
Nd	n.d.	n.d.	n.d.	n.d.	3.7	n.d.	n.d.	n.d.	17.2	11.4	n.d.	19.8	n.d.	14.9	6.02	n.d.	n.d.	10.8
Sm	n.d.	n.d.	n.d.	n.d.	1.7	n.d.	n.d.	n.d.	4.9	3.36	n.d.	5.88	n.d.	4.18	2.08	n.d.	n.d.	3.37
Eu	n.d.	n.d.	n.d.	n.d.	0.73	n.d.	n.d.	n.d.	1.78	1.22	n.d.	2	n.d.	1.55	0.58	n.d.	n.d.	1.18
Tb	n.s.	n.s.	n.d.	n.d.	0.49	n.d.	n.d.	n.d.	1	0.71	n.d.	0	n.d.	0	0.55	n.d.	n.d.	0.66
Tm	n.d.	n.d.	n.d.	n.d.	0.34	n.d.	n.d.	n.d.	0.49	0.38	n.d.	0.58	n.d.	0	0.34	n.d.	n.d.	0.34
Yb	n.d.	n.d.	n.d.	n.d.	2.2	n.d.	n.d.	n.d.	2.92	2.15	n.d.	3.29	n.d.	2.38	2.03	n.d.	n.d.	1.95
Hf	n.d.	n.d.	n.d.	n.d.	0.91	n.d.	n.d.	n.d.	3.67	2.24	n.d.	4.16	n.d.	2.9	1.11	n.d.	n.d.	2.07
Ta	n.d.	n.d.	n.d.	n.d.	0.06	n.d.	n.d.	n.d.	0.81	0.49	n.d.	0.92	n.d.	0.61	0.16	n.d.	n.d.	0.44
Th	n.d.	n.d.	n.d.	n.d.	0.34	n.d.	n.d.	n.d.	1.16	0.65	n.d.	0.97	n.d.	0.78	0.64	n.d.	n.d.	0.51
U	n.d.	n.d.	n.d.	n.d.	0.13	n.d.	n.d.	n.d.	0.33	0.34	n.d.	0	n.d.	0.21	0	n.d.	n.d.	0.12

*Major elements are normalized to 100 percent, less H_2O and CO_2 or LOI (loss on ignition); n.d. = not determined. Analysts: A. Bartel, L. Espos, P. Klock, V. McDaniel, S. Neil, J. Riviello, J. Taggart, J. Dudahn, D. Burgi, R. Johnson, R. Knight, M. Malcolm, and J. L. Seeley.

SAMPLE DATA FOR TABLE 8

Sample Number	Collection Number	Lithology	Latitude	Longitude
1	82ASB011B	Metamorphosed subaerial basalt	63°08'07"	146°06'35"
2	82ASB019A	Metamorphosed pillow basalt	63°07'03"	146°06'42"
3	82ASB017A	Metamorphosed pillow basalt	63°07'08"	146°06'56"
4	82ASB008A	Metamorphosed subaerial basalt	63°08'28"	146°07'00"
5	82ASB018A	Metamorphosed pillow basalt	63°07'06"	146°06'45"
6	79ANK001B	Gabbro	63°08'53"	145°55'41"
7	82ASB010A	Metamorphosed subaerial basalt	63°08'19"	146°06'36"
8	82ASB011A	Metamorphosed subaerial basalt	63°08'07"	146°06'35"
9	82ASB009A	Metamorphosed subaerial basalt	63°08'23"	146°06'48"
10	82ASB006A	Metamorphosed subaerial basalt	63°08'43"	146°07'10"
11	82ASB005A	Metamorphosed subaerial basalt	63°08'47"	146°07'24"
12	82ASB012A	Metamorphosed pillow basalt	63°07'48"	146°06'45"
13	82ASB015A	Metamorphosed pillow basalt	63°07'32"	146°06'44"
14	82ASB014A	Metamorphosed pillow basalt	63°07'34"	146°06'50"
15	82ASB021A	Metamorphosed pillow basalt	63°06'58"	146°06'25"
16	78ANK155A	Gabbro	63°06'20"	145°42'44"
17	82ASB013A	Metamorphosed pillow basalt	63°07'38"	146°06'52"
18	82ASB007A	Metamorphosed subaerial basalt	63°08'36"	146°07'09"

TABLE 9. MAJOR- AND MINOR-ELEMENT ANALYSES OF CHISANA FORMATION AND DIORITE, GRAVINA-NUTZOTIN BELT, NUTZOTIN MOUNTAINS OF EASTERN ALASKA RANGE*

Sample Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Average
SiO_2	49.00	49.60	49.80	49.80	50.20	50.30	50.30	52.10	52.60	52.70	53.50	53.70	54.40	57.30	57.40	59.40	60.70	53.10
Al_2O_3	18.30	15.20	17.80	20.60	17.80	22.10	22.00	18.80	15.90	19.30	19.90	17.00	17.20	18.70	19.10	17.40	18.90	18.60
Fe_2O_3	5.82	4.65	5.03	4.95	3.39	2.33	2.64	4.22	4.59	4.75	4.20	4.44	4.52	3.55	3.26	3.69	3.11	4.07
FeO	5.09	5.83	5.19	4.59	6.03	5.94	5.68	5.67	7.82	4.31	4.45	7.21	6.60	3.46	3.22	2.96	2.62	5.10
MgO	5.87	10.10	6.03	3.58	6.72	3.24	3.27	4.58	4.68	4.24	3.73	3.97	3.52	2.41	2.25	3.00	1.31	4.26
CaO	10.70	10.90	13.10	12.30	13.40	12.90	12.90	10.40	9.22	9.83	10.40	8.68	8.81	7.34	8.47	6.62	6.77	10.20
Na_2O	2.72	2.27	2.04	2.55	1.52	2.03	2.07	2.67	3.44	2.63	2.62	2.97	3.05	4.24	3.93	3.91	4.08	2.87
K_2O	0.88	0.36	0.15	0.37	0.08	0.24	0.24	0.50	0.13	0.97	0.24	0.53	0.42	1.82	1.16	2.00	1.44	0.68
TiO_2	1.01	0.87	0.72	0.96	0.66	0.64	0.63	0.93	1.15	0.81	0.60	1.08	1.04	0.60	0.58	0.56	0.54	0.79
P_2O_5	0.46	0.19	0.17	0.19	0.13	0.13	0.13	0.21	0.23	0.23	0.20	0.21	0.22	0.37	0.35	0.28	0.37	0.24
MnO	0.20	0.19	0.14	0.20	0.15	0.16	0.15	0.18	0.24	0.16	0.19	0.19	0.19	0.20	0.20	0.18	0.17	0.18
H_2O^+	1.22	1.46	1.91	1.23	2.80	1.84	2.91	1.31	1.77	0.93	1.92	1.37	1.55	1.16	1.58	1.41	1.48	1.64
H_2O^-	1.35	0.44	0.51	1.15	0.59	0.22	1.08	0.53	0.21	1.16	0.24	0.40	0.32	0.15	0.26	0.32	0.29	0.54
CO_2	0.04	0.35	1.61	0.84	3.68	3.38	4.48	0.43	0.06	0.13	2.05	1.40	3.91	1.29	2.54	1.03	1.86	1.71
Sc	34.00	40.00	37.00	29.00	38.00	25.00	40.00	28.00	37.00	21.00	19.00	35.00	32.00	8.00	7.00	13.00	7.00	26.00
Cr	n.d.	n.d.	235.00	38.00	356.00	44.00	579.00	70.00	19.00	73.00	11.00	4.00	5.00	6.00	n.d.	28.00	12.00	106.00
Co	40.00	55.00	42.00	25.00	41.00	26.00	38.00	32.00	34.00	25.00	25.00	30.00	29.00	12.00	12.00	15.00	10.00	29.00
Ni	29.00	218.00	69.00	31.00	121.00	20.00	152.00	28.00	18.00	27.00	9.00	7.00	8.00	3.00	3.00	11.00	4.00	44.00
Cu	67.00	181.00	116.00	93.00	79.00	97.00	87.00	104.00	176.00	159.00	20.00	295.00	211.00	21.00	<1	40.00	47.00	105.00
Rb	20.00	3.00	9.00	7.00	<5	14.00	8.00	10.00	14.00	18.00	8.00	14.00	11.00	53.00	52.00	54.00	45.00	20.00
Sr	863.00	442.00	566.00	573.00	385.00	467.00	461.00	470.00	582.00	679.00	490.00	518.00	563.00	960.00	1,130.00	761.00	788.00	629.00
Y	24.00	24.00	17.00	17.00	17.00	16.00	19.00	23.00	25.00	20.00	18.00	26.00	23.00	20.00	22.00	18.00	22.00	21.00
Zr	84.00	81.00	58.00	67.00	58.00	54.00	61.00	88.00	93.00	84.00	70.00	87.00	87.00	125.00	145.00	122.00	146.00	89.00
Nb	<10	<10	5.00	<5	5.00	5.00	5.00	5.00	7.00	6.00	5.00	7.00	<5	7.00	<10	6.00	6.00	<10
Ba	375.00	269.00	112.00	204.00	42.00	109.00	105.00	220.00	139.00	236.00	228.00	250.00	219.00	499.00	711.00	537.00	465.00	278.00
La	17.00	6.20	7.40	7.50	4.90	4.20	5.40	10.00	9.10	9.20	7.90	8.30	8.40	22.00	22.00	25.00	22.00	12.00
Ce	36.00	16.00	18.00	18.00	11.00	11.00	12.00	22.00	21.00	19.00	18.00	19.00	20.00	49.00	52.00	52.00	46.00	26.00
Nd	23.00	11.00	12.00	13.00	8.80	7.60	8.50	15.00	16.00	16.00	11.00	12.00	13.00	27.00	29.00	25.00	25.00	16.00
Sm	5.40	3.20	2.60	3.00	2.10	2.00	2.40	3.50	3.60	3.40	2.90	3.30	3.50	5.40	6.30	4.80	5.20	3.70
Eu	1.40	0.86	1.10	1.10	0.79	0.83	0.90	1.30	1.40	1.20	1.00	1.30	1.30	1.70	1.50	1.40	1.60	1.20
Gd	4.90	3.40	n.d.	n.d.	2.60	2.40	2.70	n.d.	n.d.	n.d.	n.d.	4.10	n.d.	n.d.	4.90	n.d.	n.d.	3.60
Tb	0.68	0.51	0.53	0.49	0.42	0.43	0.44	0.56	0.76	0.62	0.48	0.62	0.77	0.73	0.68	0.60	0.66	0.59
Dy	4.30	3.30	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.20	n.d.	n.d.	3.90
Tm	0.37	0.31	n.d.	n.d.	n.d.	n.d.	0.26	n.d.	n.d.	n.d.	n.d.	0.37	n.d.	n.d.	0.35	n.d.	n.d.	0.33
Yb	2.40	1.90	1.60	2.10	1.50	1.60	1.60	2.10	2.80	1.90	2.00	2.50	2.70	2.50	2.00	2.10	2.20	2.10
Lu	0.36	0.30	0.24	0.32	0.23	0.23	0.23	0.32	0.42	0.29	0.31	0.40	0.39	0.35	0.31	0.35	0.33	0.32
Hf	n.d.	n.d.	1.40	n.d.	1.10	1.10	1.20	2.20	2.40	2.30	1.70	2.10	2.30	3.20	n.d.	3.40	3.60	2.20
Ta	n.d.	n.d.	0.10	n.d.	0.073	0.06	0.084	0.19	0.15	0.16	0.14	0.12	0.13	0.31	n.d.	0.41	0.36	0.18
Th	n.d.	n.d.	0.90	n.d.	0.70	0.50	0.80	1.70	1.30	1.10	1.00	1.10	1.10	2.80	n.d.	4.30	3.20	1.60
U	n.d.	n.d.	0.40	n.d.	0.30	0.20	0.30	0.50	n.d.	0.40	0.40	0.40	0.30	1.20	n.d.	1.30	1.40	0.60

*Major elements are normalized to 100 percent, less H_2O and CO_2; n.d. = not determined. Analysts: A. Bartel, J. Budahn, R. W. Knight, M. Malcolm, C. Mason, J. Ryder, R. Johnson, and K. Dennen.

SAMPLE DATA FOR TABLE 9

Sample Number	Collection Number	Type of Deposit	Elevation (ft)	Location
1	82-22	Flow	5,000	Gold Hill, NW1/4,S9,T6N,R13E.
2	82-13	Flow	5,510	Toby Creek, NW1/4,S34,T4N,R20E.
3	CH-10	Flow	5,150	Slope southeast of Bonanza Creek, SE1/4,S25,T4N,R19E.
4.	CH-14	Pillow lava	4,670	Bonanza Creek, SE1/4,S19,T4N, R20E.
5	CH-3	Flow	4,830	Slope southeast of Bonanza Creek, SE1/4,S25,T4N,R19E.
6	CH-2	Flow	4,780	Slope southeast of Bonanza Creek, NE1/4,S25,T4N,R19E.
7.	CH-1	Dike	4,580	Little Eldorado Creek, NE1/4,S25, T4N,R19E.
8.	CH-5	Dike	5,050	Ridge southeast of Bonanza Creek, SW1/4,S30,T4N,R20E.
9	CH-16	Dike	5,280	Toby Creek, NE1/4,S35,T4N,R20E.
10	CH-13	Flow(?)	4,580	Bonanza Creek, NW1/4,S30,T4N, R20E.
11	CH-15	Flow	4,350	Bonanza Creek, NE1/4,S35,T4N, R19E.
12	CH-4	Flow	4,900	Slope southeast of Bonanza Creek, SE1/4,S25,T4N,R19E.
13	CH-8	Flow	4,400	Bonanza Creek, NW1/4,S36,T4N, R19E.
14	CH-7	Plug	4,480	Bonanza Creek, SE1/4,S25,T4N, R19E.
15	82-15	Flow	4,510	Bonanza Creek, SE1/4,S25,T4N, R19E.
16	CH-17	Diorite stock	4,650	Intersection of Skookum Creek and Little Eldorado Creek, SE1/4,S24, T4N,R19E.
17	CH-9	Plug	4,700	Slope southeast of Bonanza Creek, NW1/4,S36,T4N,R19E.

TABLE 10. ANALYSES OF THE TALKEETNA FORMATION, TALKEETNA MOUNTAINS, SOUTHERN ALASKA*

Sample Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Average†
SiO_2	50.5	51.6	51.8	52.1	52.3	52.4	52.6	55	56.5	59.1	60.6	64.9	70.5	71.5	51.9
Al_2O_3	18.4	18.1	19	17.1	17.9	17.9	16.9	17	17	16.5	17.9	13.6	13.9	13.9	17.9
Fe_2O_3	3.78	4.68	2.76	4.84	5.37	4.29	4.13	4.47	4.42	6.97	3.66	5.31	1.35	1.02	4.26
FeO	8.4	6.52	7.24	6.86	8.23	5.66	7.27	5.18	5.38	5.53	3.65	3.01	3.28	3.22	7.17
MgO	4.44	4.2	4.07	4.98	5.8	4.85	4.94	3.43	3.91	2.69	2.17	2.64	1.56	1.35	4.75
CaO	8.24	8.84	9.29	8.22	3.24	9.91	8.86	6.37	6.81	2.03	2.77	3.39	2.58	2.09	8.09
Na_2O	3.24	3.57	3.96	3.6	6.21	2.98	3.33	6.47	3.2	5.49	6.08	4.93	5.14	5.74	3.84
K_2O	1.62	0.88	0.54	0.94	0.11	0.78	0.75	0.8	1.17	0.13	2.03	0.91	1	0.49	0.81
TiO_2	1.21	1.11	1.08	0.94	1.4	0.93	0.95	0.87	1.1	1.26	1.01	0.87	0.5	0.45	1.09
P_2O_5	0.22	0.22	0.19	0.13	0.22	0.18	0.15	0.28	0.36	0.15	0.27	0.21	0.09	0.09	0.19
MnO	0.19	0.15	0.13	0.22	0.27	0.17	0.18	0.18	0.16	0.21	0.16	0.18	0.11	0.1	0.19
H_2O^+	1.81	1.61	1.93	2.38	3.77	0.51	1.64	3.28	6.08	3.06	1.9	0.87	1.82	1.41	1.95
H_2O^-	0.32	0.51	0.44	0.37	0.27	1.09	0.52	0.87	2.46	0.89	0.48	0.21	0.32	0.12	0.5
CO_2	0.02	0.09	0.1	0.12	0.47	0.1	0.12	3.32	0.73	0.08	0.25	0.15	1.32	0.78	0.15
FeO^*/MgO	2.66	2.55	2.38	2.25	2.26	1.96	2.23	2.68	2.4	4.39	3.18	2.95	2.88	3.04	2.71
Sc	33	53	31	55	62	35	41	25	29	35	23	25	14	21	44
Cr	34	86	49	26	31	145	47	31	45	13	3	15	8	<1	60
Co	n.d.	45	25	n.d.	n.d.	34	31	17	16	24	10	14	7	n.d.	34
Ni	22	22	16	16	12	48	16	16	5	2	<2	2	<2	4	22
Rb	31	<10	<10	24	<5	<10	14	14	16	<10	32	14	18	8	<15
Sr	445	390	465	416	145	275	370	114	1850	172	260	270	205	203	360
Y	22	28	12	20	26	17	10	31	41	34	38	28	23	25	19
Zr	83	67	62	58	80	65	46	45	78	62	71	79	40	84	66
Nb	<5	n.d.	n.d.	<5	<5	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	<5	<5
Ba	578	650	192	348	91	220	230	156	1200	106	965	740	400	255	330
La	6.8	9.1	5.5	4.1	5.8	6.1	3.3	6.4	9.1	4.9	7.4	7.4	4.8	6	5.8
Ce	15.2	21.9	14.3	8.6	12.5	14.5	8.1	13.1	22.1	10	17.8	18.3	13.6	12.3	13.6
Nd	10.4	14	10.1	6.1	11	9.6	6.7	10.2	16.9	10.2	14.2	12	7.9	10.1	9.7
Sm	3.2	4.6	2.8	2.1	4.1	2.9	2.1	2.8	4.6	2.7	4.5	3.6	2.5	3.5	3.1
Eu	1	1.6	1	0.57	0.91	0.97	0.8	1	1.4	0.97	1.6	1.1	0.72	0.77	0.98
Gd	3.9	6	n.d.	2.8	5.3	3.7	n.d.	3.4	5.7	n.d.	5.7	4.9	3.2	3.9	4.3
Tb	0.74	1.1	0.64	0.49	0.92	0.69	0.56	0.61	0.97	0.64	0.96	0.82	0.63	0.7	0.73
Dy	4.8	7.2	3.8	3	5.5	4	3	3.4	5.9	3.4	5.9	4.5	3.9	3.9	4.5
Tm	0.32	n.d.	n.d.	0.27	0.38	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	0.29	0.32
Yb	2.1	4.1	2.3	1.6	2.9	2.6	1.9	2.3	4	2.3	3.9	3.3	2.8	1.9	2.5
Lu	0.35	0.61	0.34	0.24	0.41	0.41	0.31	0.35	0.62	0.37	0.59	0.49	0.43	0.23	0.38
Hf	n.d.	2.8	1.7	n.d.	n.d.	1.8	1.1	1.5	2.6	1.4	2.3	2.3	1.8	n.d.	1.8
Ta	n.d.	0.14	0.15	n.d.	n.d.	0.11	0.07	0.08	0.18	0.06	0.11	0.13	0.07	n.d.	0.12
Th	n.d.	1.4	0.5	n.d.	n.d.	0.7	0.4	0.6	1.2	0.8	0.7	1.1	0.7	n.d.	0.7
U	n.d.	0.8	0.5	n.d.	n.d.	0.5	1.2	0.6	0.7	0.5	0.5	1	0.7	n.d.	0.7

*Major elements are normalized to 100 percent, less H_2O and CO_2; n.d. = not determined. Analysts: J. Carr, J. S. Wahlberg, A. Bartel, J. Taggart, J. Baker, M. Taylor, R. Johnson, H. Rose, B. McCall, G. Sellers, J. Lindsay, P. Briggs, L. J. Schwartz, D. McKown, and R. W. Knight.

†Average 50.5—52.6 percent SiO_2.

SAMPLE DATA FOR TABLE 10

Sample Number	Collection Number	Type of Deposit	Elevation (ft)	Location
1	B80A-19	Plug	4,150	Glacial Fan Creek, SW1/4,S9, T20N,R11E.
2	79AGZ-23	Sill(?)	6,000	Gunsight Mountain, NW1/4,S9, T20N,R11E.
3	79AGZ-19	Dike	2,250	West of Chickaloon River, NE1/4, S30,T21N,R6E.
4	B81A-39	Flow	3,700	Glacial Fan Creek, NE1/4,S16, T20N,R11E.
5	B81A-37	Clast	3,685	Glacial Fan Creek, NE1/4,S16, T20N,R11E.
6	79AGZ-24	Dike	3,110	Flume Creek, NE1/4,S26,T22N, R10E.
7	79AGZ-12	Flow(?)	3,560	Glacial Fan Creek, NW1/4,S16, T20N,R11E.
8	79AGZ-5A	Tuff	3,750	West of Glenn Highway, SW1/4, S36,T21N,R12E.
9	79AGZ-5	Tuff	3,750	West of Glenn Highway, SW1/4, S36,T21N,R12E.
10	79AGZ-9	Tuff	4,260	Camp Creek, NW1/4,S10,T20N, R11E.
11	79AGZ-21	Dike	6,360	Gunsight Mountain, SW1/4,S4, T20N,R11E.
12	79AGZ-20	Clast	6,300	Gunsight Mountain, SW1/4,S4, T20N,R11E.
13	79AGZ-15	Clast	1,780	Caribou Creek, SW1/4,S20,T20N, R10E.
14	B81A-40	Clast	1,780	Caribou Creek, SW1/4,S20,T20N, R10E.

TABLE 11a. ANALYSES OF ROCKS OF SHUYAK FORMATION, SOUTHWESTERN ALASKA*

Sample Number	Shuyak Formation greenstones—Afognak and Shuyak Islands																					
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
SiO_2	47.71	47.95	48.08	48.26	48.49	48.53	48.96	48.96	49.61	49.82	50.08	50.49	50.68	50.85	50.97	51.18	51.32	51.61	51.86	52.01	52.12	53.4
Al_2O_3	16.98	14.11	16.93	16.18	15.88	15.66	15.55	21.78	15.56	14.75	15.61	15.83	17.4	16.24	13.88	13.72	14.75	14.93	13.4	16.01	15.58	16.03
Fe_2O_3*	11.54	9.91	12.68	12.81	13.01	12.77	12.64	9.39	10.29	10.77	10.48	10.82	13.17	10.34	11.71	12.81	12.48	12.35	11.7	9.34	10.19	9.78
FeO	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
MgO	8.35	6	7.62	8.73	9.27	7.73	7.19	5.12	5.89	9.02	11.21	7.32	4.57	7.17	3.66	4.3	5.22	6.52	3.31	5.39	5.02	4.87
CaO	12.25	16.21	11.39	11.21	0.97	12.55	11.9	10.77	14.96	12.88	11.11	9.03	9.46	9.19	10.12	8.5	7.6	10.25	9.78	12.18	12.22	9.94
Na_2O	1.88	3.18	1.8	1.52	0.85	1.51	2.46	2.3	2.52	1.24	0.75	2.93	2.38	2.9	5.33	5.2	4.77	2	6.13	3.69	3.47	4.5
K_2O	0.39	0.24	0.28	0.17	0.06	0.16	0.23	0.82	0.09	0.83	0.15	0.99	1.04	0.81	0.75	0.48	0.29	0.33	0.32	0.24	0.25	0.32
TiO_2	0.62	1.86	0.94	0.86	0.95	0.81	0.83	0.61	0.81	0.48	0.4	2.01	0.99	2.04	2.78	3.09	2.91	1.66	2.76	0.88	0.88	0.88
P_2O_5	0.06	0.35	0.08	0.07	0.08	0.08	0.08	0.08	0.08	0.05	0.04	0.38	0.13	0.28	0.61	0.53	0.47	0.16	0.57	0.11	0.09	0.11
MnO	0.2	0.2	0.2	0.18	0.18	0.19	0.18	0.16	0.18	0.16	0.15	0.2	0.19	0.17	0.19	0.19	0.21	0.18	0.18	0.16	0.19	0.16
Total	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
LOI	5.18	9.26	2.79	2.7	2.89	1.45	3.54	3.17	4.43	2.13	2.66	5.21	1.53	2.18	0.87	0.77	1.12	1.22	0.43	4.44	3.14	2.84
Sc	n.d.	n.d.	n.d.	n.d.	n.d.	40.5	n.d.	n.d.	n.d.	40.5	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	36	32.9	n.d.	n.d.	n.d.
Cr	n.d.	n.d.	n.d.	n.d.	n.d.	523	n.d.	n.d.	n.d.	875	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	120	55	n.d.	n.d.	n.d.
Co	n.d.	n.d.	n.d.	n.d.	n.d.	56	n.d.	n.d.	n.d.	45	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	38.7	29	n.d.	n.d.	n.d.
Ni	186	121	196	n.d.	195	208	170	n.d.	171	143	273	n.d.	28	133	n.d.	20	30	83	50	167	n.d.	164
Rb	15	6	4	8	6	1	10	13	6	11	n.d.	12	18	14	17	1	5	7	8	n.d.	n.d.	4
Sr	265	152	249	228	170	188	450	428	231	246	259	168	305	380	242	138	180	231	198	250	219	270
Y	16	30	23	22	22	19	20	9	18	15	13	35	19	38	67	57	58	29	62	20	21	22
Zr	35	138	43	35	38	36	34	29	33	21	19	158	44	175	291	280	258	99	288	33	35	35
Nb	5	8	3	1	4	5	2	4	2	1	1	10	4	9	15	16	12	9	12	2	2	2
Ba	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
La	n.d.	n.d.	n.d.	n.d.	n.d.	1.35	n.d.	n.d.	n.d.	0.4	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	7.5	46.8	n.d.	n.d.	n.d.
Ce	n.d.	n.d.	n.d.	n.d.	n.d.	4.4	n.d.	n.d.	n.d.	1.7	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	15.5	9	n.d.	n.d.	n.d.
Sm	n.d.	n.d.	n.d.	n.d.	n.d.	1.37	n.d.	n.d.	n.d.	0.85	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.08	2.58	n.d.	n.d.	n.d.
Eu	n.d.	n.d.	n.d.	n.d.	n.d.	0.51	n.d.	n.d.	n.d.	0.29	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	1.28	1.87	n.d.	n.d.	n.d.
Tb	n.d.	n.d.	n.d.	n.d.	n.d.	0.41	n.d.	n.d.	n.d.	0.34	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	0.88	5.5	n.d.	n.d.	n.d.
Yb	n.d.	n.d.	n.d.	n.d.	n.d.	1.96	n.d.	n.d.	n.d.	1.79	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	2.46	0.82	n.d.	n.d.	n.d.
Lu	n.d.	n.d.	n.d.	n.d.	n.d.	0.27	n.d.	n.d.	n.d.	0.32	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	0.3	7.2	n.d.	n.d.	n.d.
Hf	n.d.	n.d.	n.d.	n.d.	n.d.	0.83	n.d.	n.d.	n.d.	0.52	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	2.8	0.9	n.d.	n.d.	n.d.
Ta	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	0.48	1.19	n.d.	n.d.	n.d.
Th	n.d.	n.d.	n.d.	n.d.	n.d.	0.27	n.d.	n.d.	n.d.	0.26	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	0.69	n.d.	n.d.	n.d.	n.d.

Major elements are normalized to 100 percent; LOI = loss on ignition; Fe_2O_3, total Fe expressed as Fe_2O_3; n.d. = not determined.

TABLE 11b. ANALYSES OF ROCKS OF MIDDLE CAPE VOLCANICS AND PUALE BAY VOLCANICS, SOUTHWESTERN ALASKA*

Sample	Middle Cape Volcanics				Puale Bay Volcanics					
	Kodiak Island				Alaska Peninsula					
Number	1	2	3	4	1	2	3	4	5	6
SiO_2	66.22	71.03	72.43	72.68	49.57	50.66	51.58	54.03	56.44	59.45
Al_2O_3	15.06	13.88	13.38	13.25	13.22	18.04	17.87	15.75	18.45	18.82
Fe_2O_3*	5.61	5.3	4.58	4.08	9.42	10.08	9.22	8.34	7.3	5.59
FeO	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
MgO	1.52	1.38	1.21	1.1	8.71	8.21	3.69	6.27	4.11	3.77
CaO	3.8	1.12	1.12	1.61	13.21	8.31	9.88	7.92	4.84	3.01
Na_2O	6.85	5.99	6.29	5.96	2.19	2.74	4.62	4.36	6.51	8.08
K_2O	0.03	0.56	0.33	0.65	2.33	0.56	1.89	2.08	1.24	0.42
TiO_2	0.65	0.51	0.45	0.46	0.93	1.16	0.89	0.86	0.8	0.56
P_2O_5	0.19	0.1	0.09	0.09	0.25	0.16	0.16	0.23	0.22	0.21
MnO	0.07	0.13	0.12	0.1	0.18	0.09	0.2	0.16	0.09	0.08
LOI	2.54	1.59	1.36	1.96	7.03	5.86	7.53	4.37	3.02	3.51
Sc	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Cr	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Co	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Ni	n.d.	n.d.	n.d.	n.d.	80	56	20	n.d.	n.d.	31
Rb	n.d.	n.d.	n.d.	n.d.	16	4	24	21	11	5
Sr	n.d.	n.d.	n.d.	n.d.	509	438	943	526	640	593
Y	n.d.	n.d.	n.d.	n.d.	18	18	24	22	23	20
Zr	53	108	96	96	49	45	81	82	97	79
Nb	2	4	4	3	5	3	4	5	3	2
Ba	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
La	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Ce	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Sm	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Eu	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Tb	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Yb	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Lu	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Hf	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Ta	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Th	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.

Major elements are normalized to 100 percent; LOI = loss on ignition; Fe_2O_3 = total Fe expressed as Fe_2O_3; n.d. = not determined.

SAMPLE DATA FOR TABLE 11a

Sample Number	Collection Number	Lithology	Latitude (N)	Longitude (W)	Quadrangle
		Shuyak Formation Greenstones			
1	B16-1Y	Metabasalt	58°23'20"	152°52'04"	Afognak B-3
2	B20-3Y	Metabasalt	58°24'23"	152°49'00"	Afognak B-3
3	B10-1Y	Metabasalt	58°24'35"	152°53'10"	Afognak B-3
4	B20-5X	Metabasalt	58°24'29"	152°48'00"	Afognak B-3
5	B20-2W	Metabasalt	58°24'15"	152°51'05"	Afognak B-3
6	B1-3Y	Metabasalt	58°17'39"	152°59'12"	Afognak B-3
7	B20-5Z	Metabasalt	58°24'29"	152°48'00"	Afognak B-3
8	S30-20Z	Metabasalt	58°26'57"	152°41'00"	Afognak B-3
9	B20-5Y	Metabasalt	58°24'29"	152°48'00"	Afognak B-3
10	B1-1Z	Metabasalt	58°18'08"	153°01'35"	Afognak B-3
11	B16-1W	Metabasalt	58°23'20"	152°52'04"	Afognak B-3
12	B20-3X	Metabasalt	58°24'23"	152°49'00"	Afognak B-3
13	B1-3X	Metabasalt	58°17'39"	152°59'12"	Afognak B-3
14	B10-4Z	Metabasalt	58°22'59"	152°50'00"	Afognak B-3
15	S30-8Y	Metabasalt	58°28'10"	152°34'30"	Afognak B-2
16	B10-5Y	Metabasalt	58°22'19"	152°50'00"	Afognak B-3
17	S30-10Z	Metabasalt	58°26'57"	152°41'00"	Afognak B-3
18	S30-6Z	Metabasalt	58°28'10"	152°34'10"	Afognak B-2
19	S30-8Z	Metabasalt	58°28'10"	152°34'30"	Afognak B-2
20	B20-2Y	Metabasalt	58°24'15"	152°51'05"	Afognak B-3
21	B20-2Z	Metabasalt	58°24'15"	152°51'05"	Afognak B-3
22	B20-2X	Metabasalt	58°24'15"	152°51'05"	Afognak B-3

SAMPLE DATA FOR TABLE 11b

Sample Number	Collection Number	Lithology	Latitude (N)	Longitude (W)	Quadrangle
		Middle Cape Volcanics, Kodiak Island			
1	11-8	Metarhyodacite	57°21'50"	154°45'40"	Karluk B-3
2	11-9D	Metarhyodacite	57°21'50"	154°45'40"	Karluk B-3
3	11-9E	Metarhyodacite	57°21'50"	154°45'40"	Karluk B-3
4	11-9F	Metarhyodacite	57°21'50"	154°45'40"	Karluk B-3
		Puale Bay Volcanics, Alaska Peninsula			
1	P2-4W	Metabasalt	57°43'37"	115°18'40"	Karluk C-4 and C-5
2	P2-5Y	Metabasalt	57°43'30"	115°20'00"	Karluk C-4 and C-5
3	P3-1Y	Metabasalt	57°40'40"	115°23'10"	Karluk C-4 and C-5
4	P3-2Y	Metaandesite	57°40'47"	115°24'10"	Karluk C-4 and C-5
5	P3-1W	Metaandesite	57°40'40"	115°23'10"	Karluk C-4 and C-5
6	P3-1X	Metadacite	57°40'40"	115°23'10"	Karluk C-4 and C-5

TABLE 12. MAJOR- AND MINOR-ELEMENT ANALYSES OF ROCKS OF LIBERTY CREEK AND ICEBERG LAKE, CHUGACH TERRANE, SOUTHERN ALASKA

Sample Number	1	2	3	4
SiO_2	49.69	58.49	52.88	48.97
Al_2O_3	15.01	12.95	14.35	15.12
Fe_2O_3	6.12	1.57	0.01	8.54
FeO	4.93	6.95	9.17	4.79
MgO	6.20	3.19	6.30	5.80
CaO	11.18	14.73	12.56	10.97
Na_2O	2.85	0.63	2.30	3.24
K_2O	2.25	0.23	0.08	0.97
TiO_2	1.42	1.03	1.93	1.23
P_2O_5	0.15	0.10	0.21	0.15
MnO	0.22	0.14	0.20	0.22
H_2O^+	2.44	1.73	3.25	2.24
H_2O^-	0.05	0.05	0.12	0.01
CO_2	0.81	1.64	2.54	0.96
Sc	46.00	32.00	41.00	51.00
Cr	209.00	77.70	210.00	147.00
Co	36.10	24.30	36.00	36.10
Ni	64.00	41.00	62.00	53.00
Cu	56.00	79.00	74.00	92.00
Zn	n.d.	15.70	24.00	n.d.
Rb	51.50	6.00	n.d.	18.60
Sr	60.00	270.00	184.00	122.00
Y	26.00	17.00	19.00	17.00
Zr	70.00	50.00	64.00	50.00
Nb	<10.00	<10.00	<10.00	<10.00
Sb	0.138	0.231	2.01	n.d.
Cs	2.24	<0.35	<0.27	0.371
Ba	110.00	<30.00	50.00	<30.00
La	2.77	2.18	2.72	2.83
Ce	7.78	6.01	6.56	7.48
Nd	8.80	5.81	7.00	8.50
Sm	3.52	2.27	2.62	2.97
Eu	1.24	0.859	0.993	1.13
Gd	4.60	3.30	4.00	3.68
Tb	0.803	0.599	0.697	0.663
Tm	0.502	0.39	0.448	0.468
Yb	3.34	2.36	2.82	2.84
Lu	0.546	0.368	0.404	0.45
Ta	0.133	0.11	0.126	0.174
Th	<0.050	0.106	0.094	0.169
Hf	2.08	1.47	1.84	1.47
U	n.d.	n.d.	0.14	n.d.

SAMPLE DATA FOR TABLE 12

Sample Number	Collection Number	Name	Quadrangle*	Latitude	Longitude
1	84APr93	Actinolite-quartz-albite-epidote schist.	VA C-2	61°38'25"	144°37'05"
2	84ANK152	Quartz-albite-chlorite-epidote-actinolite schist.	VA C-2	61°38'25"	144°37'05"
3	84ANK154	Quartz-albite-chlorite-epidote-actinolite schist.	VA C-2	61°34'32"	144°25'50"
4	84APr136A	Quartz-calcite-chlorite-crossite-epidote schist.	VA C-8	61°35'30"	146°35'55"

*VA = Valdez

TABLE 13. ANALYSES OF ROCKS OF THE UYAK COMPLEX, KODIAK ISLAND, SOUTHWESTERN ALASKA*

Sample Number	1	2	3	4	5	6	7	8	9
				Uyak Complex Greenstones—Kodiak Island					
SiO_2	47.77	48.52	48.83	49.24	49.27	50.54	51.71	51.76	51.83
Al_2O_3	12.53	15.69	14.78	17.40	16.14	21.05	15.68	15.56	15.61
Fe_2O_3*	8.82	11.06	12.5	12.55	11.68	11.78	10.64	12.2	12.15
FeO	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
MgO	4.23	5.28	8.71	4.52	9.33	4.24	6.68	6.3	6.23
CaO	23.36	12.39	11.11	10.63	10.18	5.19	10.45	7.41	7.8
Na_2O	1.38	3.49	2.1	3.94	1.58	3.77	3.14	3.94	3.86
K_2O	0.15	0.92	0.54	0.16	0.16	2.24	0.35	0.98	0.74
TiO_2	1.43	2.02	0.87	1.13	1.38	0.95	1.11	1.48	1.45
P_2O_5	0.21	0.44	0.08	0.13	0.12	0.12	0.08	0.15	0.13
MnO	0.12	0.17	0.49	0.22	0.17	0.14	0.16	0.22	0.2
LOI	13.56	7	12.45	5.08	5.71	4.91	4.45	2.66	1.9
Sc	n.d.	n.d.	n.d.	n.d.	45.3	n.d.	39.9	44.3	42.2
Cr	n.d.	n.d.	n.d.	n.d.	275	n.d.	350	188	177
Co	n.d.	n.d.	n.d.	n.d.	49.1	n.d.	44.7	44.2	39.2
Ni	80	98	66	65	86	210	56	50	50
Rb	2	17	15	9	n.d.	41	18	24	n.d.
Sr	201	480	502	190	196	66	345	419	n.d.
Y	20	44	34	36	28	28	27	42	n.d.
Zr	88	152	45	58	64	54	62	88	87
Nb	11	16	2	3	4	3	3	3	4
Ba	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
La	n.d.	n.d.	n.d.	n.d.	3.7	n.d.	1.57	3.5	3.2
Ce	n.d.	n.d.	n.d.	n.d.	11.2	n.d.	4.6	10.6	9.7
Sm	n.d.	n.d.	n.d.	n.d.	3.05	n.d.	2.5	3.83	3.53
Eu	n.d.	n.d.	n.d.	n.d.	1.09	n.d.	0.89	1.26	1.16
Tb	n.d.	n.d.	n.d.	n.d.	0.53	n.d.	0.46	1.19	0.7
Yb	n.d.	n.d.	n.d.	n.d.	2.63	n.d.	2.46	3.7	3.47
Lu	n.d.	n.d.	n.d.	n.d.	0.43	n.d.	0.39	0.61	0.55
Hf	n.d.	n.d.	n.d.	n.d.	1.96	n.d.	1.7	2.5	2.5
Ta	n.d.	n.d.	n.d.	n.d.	0.12	n.d.	n.d.	0.17	n.d.
Th	n.d.	n.d.	n.d.	n.d.	0.18	n.d.	0.37	0.25	0.44

*Major elements are normalized to 100 percent, less LOI (loss on ignition, Fe_2O_3 = total iron expressed as Fe_2O_3, n.d. = not determined.

SAMPLE DATA FOR TABLE 13

Sample Number	Collection Number	Quadrangle	Location	Latitude	Longtitude
1	B7-3z	Afognak B-3	South coast Ban Island	58°17'57"	152°59'55"
2	M9-4z	Afognak A-3	Northeast shore Malina Bay	58°11'30"	153°00'40"
3	V7-1z	Afognak A-4	South shore Raspberry Strait	58°05'33"	153°10'30"
4	V2-1w	Afognak A-4	South shore Raspberry Strait	58°05'33"	153°10'30"
5	B7-2z	Afognak B-3	South coast Ban Island	58°17'35"	152°49'30"
6	V5-1z	Afognak A-4	Northeast shore Raspberry Strait	58°08'08"	153°11'00"
7	M1-3z	Afognak A-4	Northeast shore Malina Bay	58°14'20"	152°57'20"
8	M11-5z	Afognak A-3	Headland between Malka Bay and Malina Bay	58°13'30"	152°59'30"
9	M11-5y	Afognak A-3	Headland between Malka Bay and Malina Bay	58°13'30"	152°59'30"

TABLE 14. MAJOR- AND MINOR-ELEMENT ANALYSES OF ROCKS OF THE MCHUGH COMPLEX AND THE KELP BAY GROUP, SOUTHERN AND SOUTHWESTERN ALASKA*

Sample Number	a. McHugh Complex 1	2	3	4	5	6	b. Kelp Bay Group 1	2
SiO_2	45.51	46.99	49.91	50.44	50.52	52.16	45.90	47.50
Al_2O_3	12.94	13.93	12.82	13.48	13.64	12.91	15.40	18.50
Fe_2O_3	3.64	4.31	6.76	4.90	4.03	3.41	1.90	1.40
FeO	7.53	6.93	8.67	9.99	8.56	9.02	10.10	4.70
MgO	3.25	6.88	6.82	8.00	6.74	6.[illegible]	7.70	3.80
CaO	18.48	15.52	7.09	5.74	9.77	10.60	7.60	11.80
Na_2O	5.01	2.55	3.40	4.20	4.11	2.48	3.50	4.30
K_2O	0.30	0.53	1.23	0.27	0.06	0.02	0.13	0.11
TiO_2	2.89	1.98	2.76	2.45	2.17	2.15	1.10	0.97
P_2O_5	0.29	0.20	0.27	0.26	0.21	0.21	0.11	0.13
MnO	0.17	0.19	0.26	0.25	0.20	0.21	0.24	0.13
H_2O^+	2.52	3.56	3.48	4.01	2.83	3.62	4.20	2.30
H_2O^-	0.47	0.27	0.80	0.70	0.27	0.44	0.43	0.10
CO_2	10.10	2.32	0.38	0.46	0.14	0.17	0.40	3.80
Sc	43.00	47.00	45.00	45.00	46.00	43.00	46.30	29.60
Cr	78.20	195.00	57.50	62.40	135.00	167.00	141.50	266.50
Co	30.60	34.70	38.90	42.20	36.00	33.40	52.40	34.80
Ni	33.00	56.00	44.00	46.00	45.00	55.00	n.d.	n.d.
Cu	42.00	37.00	41.00	72.00	67.00	49.00	n.d.	n.d.
Zn	75.00	67.00	106.00	85.50	66.70	<62.00	108.00	78.00
Rb	10.30	14.30	22.60	9.60	n.d.	6.03	<60.00	<10.00
Sr	52.50	135.00	82.00	110.00	60.00	100.00	263.00	757.00
Y	40.00	30.00	44.00	44.00	36.00	36.00	22.00	<5.00
Zr	150.00	95.00	155.00	135.00	115.00	115.00	<200.00	<200.00
Nb	<10.00	<10.00	<10.00	<10.00	<10.00	<10.00	n.d.	n.d.
Sb	<0.15	n.d.	<0.094	n.d.	<0.15	<0.14	<1.00	3.10
Cs	9.89	0.767	8.58	6.31	17.00	0.698	1.00	<0.60
Ba	400.00	70.00	325.00	265.00	30.00	84.00	<400.00	<350.00
La	5.91	3.94	5.05	4.24	3.97	4.35	1.00	6.00
Ce	17.80	13.90	17.40	14.90	14.60	13.80	4.00	10.00
Nd	16.70	12.50	16.00	14.50	14.90	12.80	<20.00	<15.00
Sm	6.28	4.41	6.13	5.63	5.28	4.89	2.40	2.40
Eu	1.87	1.65	1.79	1.74	1.74	1.61	0.80	0.70
Gd	7.76	5.88	7.91	7.30	6.90	6.49	3.10	2.50
Tb	1.35	1.06	1.32	1.26	1.16	1.16	0.70	0.50
Ho	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	0.30	<0.40
Tm	0.921	0.643	0.939	0.867	0.763	n.d.	0.40	0.30
Yb	5.56	4.07	5.72	5.51	4.70	4.65	3.40	1.90
Lu	0.813	0.63	0.892	0.844	0.72	0.699	0.70	0.30
Ta	0.259	0.184	0.302	0.301	0.249	0.203	<0.50	0.60
Th	0.11	0.0917	0.199	0.201	0.17	0.14	<1.00	0.60
Hf	4.44	3.03	4.13	4.10	3.64	3.35	1.50	1.60
U	1.49	0.757	0.683	0.953	0.536	0.386	<2.00	1.40

*Major elements are normalized to 100 percent, less H_2O and CO_2. n.d. = not determined.

SAMPLE DATA FOR TABLE 14

Sample Number	Collection Number	Lithology	Quadrangle	Latitude	Longitude
		A. McHugh Complex			
1	84ABR132A	Greenstone breccias	VA C-4*	61°30'55"	145°08'15"
2	84APr142A	Greenstone	VA C-4	61°31'58"	145°19'30"
3	84ASn66B	Greenstone	VA C-4	61°31'04"	145°08'53"
4	84ASn66A	Greenstone	VA C-4	61°31'04"	145°08'53"
5	84ANK182A	Greenstone	VA C-4	61°31'00"	145°18'25"
6	84APr145A	Greenstone	VA C-4	61°32'56"	145°19'29"
		B. Kelp Bay Group			
1	751	Pillow basalt	SA-O6†	57°28'07"	135°51'06"
2	561a	Pillow basalt	SA-B6	57°27'06"	135°57'02"

*VA = Valdez
†SA = Sitka

TABLE 15a. MAJOR- AND MINOR-ELEMENT ANALYSES OF ROCKS OF THE VALDEZ GROUP, WESTERN AREA, SOUTHERN ALASKA*

Sample Number	1	2	3	4	5	6
SiO_2	44.30	48.54	50.48	51.15	52.32	53.66
Al_2O_3	15.50	15.83	15.01	15.60	14.43	13.19
Fe_2O_3	1.60	1.87	2.89	1.82	2.37	5.52
FeO	8.00	8.07	7.30	8.68	7.19	7.99
MgO	11.10	12.08	8.48	8.00	8.95	6.27
CaO	8.90	10.83	12.23	9.64	13.00	7.62
Na_2O	2.60	1.77	2.93	3.42	1.14	4.58
K_2O	0.12	0.15	0.36	0.13	0.04	0.04
TiO_2	0.90	0.63	0.72	1.17	0.35	0.87
P_2O_5	0.09	0.52	0.06	0.83	0.05	0.08
MnO	0.17	0.18	0.18	0.31	0.16	0.19
H_2O^+	4.20	3.86	2.36	2.80	2.75	1.18
H_2O^-	0.11	0.06	0.07	0.05	0.07	0.07
CO_2	1.20	0.06	<0.02	0.08	0.99	0.99
Sc	37.00	36.00	48.00	49.00	45.00	54.00
Cr	590.00	685.00	352.00	373.00	284.00	69.80
Co	50.00	46.10	45.20	39.80	34.60	43.80
Ni	n.d.	275.00	110.00	90.00	107.00	84.00
Cu	n.d.	92.00	86.00	54.00	99.00	119.00
Zn	n.d.	115.00	87.00	72.00	74.00	120.00
Rb	<10.00	40.90	12.90	<2.50	<2.50	n.d.
Sr	226.00	n.d.	n.d.	n.d.	n.d.	n.d.
S	n.d.	55.00	48.00	176.00	20.00	42.00
Y	22.00	12.00	17.00	18.00	10.00	23.00
Zr	<200.00	19.00	25.00	50.00	<10.00	28.00
Nb	n.d.	<10.00	<10.00	<10.00	<10.00	<10.00
Ba	<400.00	50.00	58.00	40.00	<20.00	40.00
La	3.00	0.864	0.99	1.85	0.292	0.796
Ce	6.00	2.81	2.37	n.d.	<1.20	3.64
Nd	<20.00	2.87	<3.50	7.00	n.d.	4.48
Sm	2.00	1.19	1.77	2.52	0.612	1.55
Eu	0.70	0.505	0.657	0.732	0.265	0.625
Gd	2.20	1.81	2.74	3.37	1.10	2.50
Tb	0.50	0.397	0.555	0.621	0.242	0.577
Dy	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Tm	0.20	0.25	0.432	0.46	0.32	0.70
Yb	2.20	2.05	2.89	2.75	1.61	3.12
Lu	0.40	0.286	0.449	0.376	0.256	0.47
Hf	1.20	0.725	1.09	1.68	0.413	1.05
Ta	0.20	0.0398	0.044	0.095	<0.06	0.348
Th	0.50	0.17	n.d.	0.20	<0.05	n.d.
U	1.40	n.d.	<0.05	n.d.	n.d.	n.d.

*Major elements are normalized to 100 percent, less H_2O and CO_2; n.d. = not determined.

SAMPLE DATA FOR TABLE 15a

Sample Number	Collection Number	Lithology	Quadrangle	Latitude	Longitude
1	690	Actinolite-chlorite-epidote schist	SA C-7	57°39'07"	136°13'07"
2	85APr164C	Metagabbro	CO D-4	60°56'34"	145°25'03"
3	85ARh121	Schistose greenstone pillow basalt	CO D-5	60°54'25"	145°38'25"
4	84APr48D	Chlorite-epidote-actinolite metatuff	VA A-5	61°11'02"	145°38'45"
5	85ARh119	Metadiabase	CO D-4	60°55'03"	145°22'41"
6	85APr106	Albite-actinolite greenschist	CO C-2	60°41'20"	144°34'15"

TABLE 15b. MAJOR- AND MINOR-ELEMENT ANALYSES OF BASALTIC ROCKS OF VALDEZ GROUP OF YAKUTAT AREA, EASTERN GULF OF ALASKA*

Sample Number	Valdez Group(?) Metabasalt 1	2	3	4	Greenstone of Yakutat Melange 5	6	7	8
SiO_2	48.8	49.1	49.3	61.5	46.7	47.6	49.9	51.7
Al_2O_3	15.5	16.1	15.1	14.7	17	15.6	13.9	13.5
Fe_2O_3	2.6	1.43	3.19	1.66	2.9	1.99	4.24	1.76
FeO	8.49	10.7	9.01	5.47	6.95	12.8	8.44	4.28
MgO	8.54	11.2	8.62	3.13	5.23	7.49	6.3	4.03
CaO	12.7	6.03	11.2	9.16	13.1	9.86	11.2	17.2
Na_2O	2.3	3.17	2.3	2.61	2.99	1.64	3.16	0.78
K_2O	0.09	0.06	0.09	0.76	2.18	0.14	0.07	0.03
TiO_2	0.73	0.99	0.98	0.74	2.3	2.45	1.9	1.42
P_2O_5	<0.05	0.01	0.05	0.13	0.56	0.17	0.15	0.12
MnO	0.19	0.19	0.14	0.15	0.17	0.21	0.22	0.21
H_2O^+	1.31	2.23	1.31	1.88	3.49	2.22	2.64	1.72
H_2O^-	0.02	0.04	0.02	0.08	0.38	0.05	0.07	0.09
CO_2	0.04	0.05	0.04	4.13	5.09	0.04	0.11	0.82
Sc	53	57	57	22	27	30	46	38
Cr	320	170	110	47	190	95	130	120
Co	n.d.	45	47	17	33	49	n.d.	n.d.
Ni	110	76	62	22	110	65	78	52
Cu	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Rb	2	3	2	26	36	3	34	4
Sr	71	77	135	343	367	249	314	549
Y	22	28	24	16	24	31	17	19
Zr	41	48	59	97	216	139	128	109
Nb	<5	<5	<5	<5	38	10	8	<5
Ba	18	28	29	450	261	61	22	22
La	0.95	2.7	2.3	14	30	11	7.6	6.6
Ce	2.7	3.7	6	24	58	23	18	14
Nd	2.6	3.9	5.5	13	31	19	13	11
Sm	1.4	1.8	2	3.3	6.5	5.3	4	2.8
Eu	0.65	0.77	0.87	0.89	1.8	1.6	1.3	1
Gd	3.3	2.5	2.1	3.6	6.2	5.1	5	3.8
Tb	n.d.	0.74	0.69	0.52	0.91	1	n.d.	0.62
Tm	0.49	0.52	0.42	0.36	0.44	0.47	0.38	0.31
Yb	2.2	3.8	3.2	2.4	2.5	3.2	1.9	1.58
Lu	0.41	0.63	0.62	0.37	0.36	0.53	0.28	0.25
Hf	n.d.	1	2	3	5	4	n.d.	n.d.
Ta	n.d.	0.6	0.5	0.4	2.6	0.8	n.d.	n.d.
Th	n.d.	<0.9	<0.9	2.9	3.3	3	n.d.	n.d.
U	n.d.	<0.7	<0.7	1.3	1	0.5	n.d.	n.d.

*Major elements are normalized to 100 percent, less H_2O and CO_2; n.d. = not determined. Analysts: G. Kawakita, J. S. Wahlberg, J. Taggart, J. Baker, K. McKowen, R. W. Knight, P. A. Baedecker, V. McDaniel, and R. Johnson.

SAMPLE DATA FOR TABLE 15b

Sample Number	Collection Number	Quadrangle	Latitude	Longititude
1	80APr40A	YA D-3*	59°50'00"	138°51'00"
2	78APr5	YA A-1	59°14'00"	138°07'00"
3	78APr12A	YA C-2	59°32'08"	138°35'00"
4	78APr7	YA A-1	59°11'04"	138°03'05"
5	78APr17	YA B-2	59°26'08"	138°29'09"
6	78APr18A	YA B-2	59°29'30"	138°35'30"
7	80APr43	YA D-4	59°52'00"	139°20'00"
8	80APr44	YA D-4	59°52'00"	139°20'00"

*YA = Yakutat

TABLE 16. ANALYSES OF GREENSTONE OF GHOST ROCKS FORMATION, KODIAK ISLAND, SOUTHWESTERN ALASKA*

Sample Number	1	2	3	4	5	6	7	8	9	10	11
SiO_2	53.06	54.28	54.52	54.57	54.69	54.76	56.06	56.95	58.13	58.72	59.53
Al_2O_3	15.73	16.05	15.6	15.34	16.16	16.76	17.12	17.13	16.31	15.38	15.65
Fe_2O_3*	7.64	8.3	8.35	8.63	8.12	8.79	6.95	6.14	6.65	8.46	6.56
FeO	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
MgO	7.33	6.96	7.03	6.19	7.78	5.6	6.05	5.71	5.61	5.07	5.02
CaO	10.83	8.61	8.31	9.14	7.43	7.32	6.8	7.62	6.48	5.16	5.88
Na_2O	3.9	4.21	4.67	4.46	4.3	4.51	5.15	4.53	5.36	4.97	4.19
K_2O	0.27	0.05	0.04	0.08	0.28	0.81	0.62	0.97	0.32	0.7	1.03
TiO_2	0.93	1.21	1.19	1.25	0.95	1.25	0.94	0.72	0.79	1.19	0.86
P_2O_5	0.18	0.19	0.17	0.19	0.15	0.09	0.18	0.12	0.2	0.22	0.17
MnO	0.14	0.14	0.14	0.15	0.13	0.1	0.13	0.11	0.15	0.13	0.12
LOI	4.16	3.37	3.71	3.37	3.92	3.72	4.39	4.79	2.54	4.42	5.08
Sc	n.d.	n.d.	n.d.	n.d.	30.3	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Cr	n.d.	n.d.	n.d.	n.d.	313	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Co	n.d.	n.d.	n.d.	n.d.	28.5	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Ni	57	87	76	65	62	n.d.	54	51	n.d.	12	17
Rb	5	n.d.	n.d.	n.d.	7	n.d.	n.d.	n.d.	n.d.	25	n.d.
Sr	102	103	122	80	142	n.d.	n.d.	n.d.	n.d.	120	n.d.
Y	28	33	33	36	26	n.d.	n.d.	n.d.	n.d.	37	n.d.
Zr	81	127	129	132	86	87	n.d.	83	87	147	136
Nb	6	12	14	12	5	7	n.d.	5	6	10	7
Ba	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
La	n.d.	n.d.	n.d.	n.d.	6	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Ce	n.d.	n.d.	n.d.	n.d.	15.7	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Sm	n.d.	n.d.	n.d.	n.d.	2.8	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Eu	n.d.	n.d.	n.d.	n.d.	0.77	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Tb	n.d.	n.d.	n.d.	n.d.	0.7	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Yb	n.d.	n.d.	n.d.	n.d.	2.34	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Lu	n.d.	n.d.	n.d.	n.d.	0.36	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Hf	n.d.	n.d.	n.d.	n.d.	2.32	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Ta	n.d.	n.d.	n.d.	n.d.	0.25	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Th	n.d.	n.d.	n.d.	n.d.	1.59	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.

*Major elements are normalized to 100 percent; LOI = loss on ignition; n.d. = not determined.

SAMPLE DATA FOR TABLE 16

Sample Number	Collection Number	Quadrangle	Location	Latitude	Longitude
1	15-2A	Kaguyak D-6	South shore Portage Bay	56°55'02"	153°54'55"
2	15-17C	Kaguyak D-6	South shore Portage Bay	56°53'54"	153°58'35"
3	15-17D	Kaguyak D-6	South shore Portage Bay	56°53'54"	153°58'35"
4	15-17A	Kaguyak D-6	South shore Portage Bay	56°53'54"	153°58'35"
5	15-2E	Kaguyak D-6	South shore Portage Bay	56°55'02"	153°54'55"
6	15-14C	Kaguyak D-6	South shore Portage Bay	56°54'53"	153°56'17"
7	15-15D	Kaguyak D-6	South shore Portage Bay	56°54'30"	153°57'30"
8	15-19B	Kaguyak D-6	South shore Portage Bay	56°55'32"	153°53'21"
9	15-19D	Kaguyak D-6	South shore Portage Bay	56°55'32"	153°53'21"
10	15-13Y	Kaguyak D-6	South shore Portage Bay	56°54'35"	153°57'25"
11	15-18A	Kaguyak D-6	South shore Portage Bay	56°55'30"	153°53'52"

TABLE 17. MAJOR- AND MINOR-ELEMENT ANALYSES OF ROCKS OF THE ORCA GROUP, PRINCE WILLIAM SOUND AND RAGGED MOUNTAINS, SOUTHERN ALASKA*

Sample	Prince William Sound								Ragged Mountains				
Number	1	2	3	4	5	6	7	8	9	10	11	12	13
SiO_2	48	49.19	49.42	51.49	52.51	52.8	53.47	55.41	48.7	49.13	51.41	52.43	52.99
Al_2O_3	12.44	15.59	15.56	14.83	15.87	12.12	18.14	11.79	20.57	15.18	14.61	18	15.71
Fe_2O_3	2.74	2.03	1.78	3.35	0.43	4.65	2.32	2.36	1.05	3.49	2.42	2.63	3.18
FeO	7.83	7.89	9.08	8.38	8.83	7.48	6.96	8.58	5.88	9.23	9.15	6.74	6.47
MgO	9.89	8.26	7.63	7.96	8.79	8.53	5.7	6.38	7.45	6.15	7.78	5.9	5.65
CaO	14.89	12.78	11.13	8.76	8.4	9.91	8.44	9.07	13.02	10.67	10.93	8.63	7.7
Na_2O	2.3	2.83	3.62	3.77	4.31	3.15	2.95	4.24	1.68	2.77	1.89	4.11	4.72
K_2O	0.66	0.1	0.2	0.49	0.12	0.11	0.51	0.07	1.05	0.49	0.13	0.13	1.54
TiO_2	0.63	1	1.2	0.72	0.53	0.97	1.06	1.64	0.39	2.36	1.26	1.05	1.64
P_2O_5	0.9	0.14	0.17	0.05	0.06	0.1	0.31	0.25	0.73	0.33	0.2	0.21	0.21
MnO	0.32	0.19	0.2	0.2	0.16	0.19	0.16	0.22	0.14	0.2	0.22	0.18	0.18
H_2O^+	4.06	1.9	2	2.47	3.4	3.28	n.d.	1.97	n.d.	n.d.	n.d.	n.d.	n.d.
H_2O^-	0.3	0.38	6.37	0.2	0.39	0.36	n.d.	0.37	n.d.	n.d.	n.d.	n.d.	n.d.
CO_2	6.11	0.14	0.03	0.08	0.04	1.71	n.d.	1.07	n.d.	n.d.	n.d.	n.d.	n.d.
Sc	42	49	46	61	49	41	32	38	46	34	51	39	30
Cr	45	187	68	106	99	211	66	69.6	130	230	79	40	96
Co	37.4	47	46	60.9	55	36	34.4	39.4	37.9	44	49.7	35.1	39.2
Ni	75	83	48	100	118	78	60	62	100	97	70	46	88
Cu	179	118	80	310	119	57	n.d.	200	n.d.	n.d.	n.d.	n.d.	n.d.
Zn	n.d.	72.1	78	n.d.	66.6	n.d.	96	n.d.	52	101	105	91	105
Rb	15	n.d.	63	19	n.d.	6.8	<2	n.d.	25	6	4	<2	26
Sr	105	96	123	225	162	140	53	125	154	301	257	196	448
Y	15	31	36	14	21	24	6	21	9	29	18	16	17
Zr	20	73	94	20	36	31	141	86	33	168	82	80	108
Nb	<10	12	13	<10	8	<10	11	10	<5	15	7	6	8
Sb	n.d.	n.d.	0.11	n.d.	0.16	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Cs	n.d.	0.27	0.21	n.d.	0.585	n.d.	0.9	n.d.	0.6	0.4	<0.9	<0.8	<0.7
Ba	100	80	77	192	79.9	52	103	86	135	60	29	17	179
La	0.721	2.76	5.17	0.699	0.633	0.879	12	6.89	2	16	7	7	10
Ce	2.6	8.58	12.6	2.5	2.27	2.63	24	18.6	4	34	19	15	22
Nd	4.3	7.38	9.28	2.57	2.18	4.79	17	12.3	<10	26	13	12	20
Sm	1.67	2.53	3.31	1.24	0.976	2.15	3.4	3.53	0.7	5.7	3.1	2.4	3.5
Eu	0.65	0.912	1.08	0.629	0.365	0.738	1.02	1.24	0.37	1.94	1.02	0.97	1.27
Gd	2.51	3.53	4.59	n.d.	1.92	3.34	5.6	4.55	<5	7.8	4.9	2.8	5.9
Tb	0.499	0.682	0.834	0.523	0.465	0.692	0.69	0.773	0.27	1.13	0.67	0.55	0.76
Tm	0.372	0.497	0.582	0.429	0.385	0.563	0.36	0.48	0.26	0.62	0.49	0.28	0.43
Yb	2.49	3.19	3.75	2.92	2.54	3.66	2.9	2.97	1	3.2	2.5	2	1.9
Lu	0.382	0.493	0.563	0.446	0.405	0.57	0.42	0.448	0.18	0.44	0.37	0.3	0.28
Ta	0.025	0.12	0.262	0.032	0.043	0.049	0.54	0.508	0.22	1.15	0.48	0.39	0.6
Th	n.d.	0.382	1.14	<0.05	0.1	n.d.	1.2	0.422	<0.5	1.1	0.5	0.5	0.8
Hf	0.92	1.69	2.44	0.822	0.567	1.26	3.1	2.54	0.6	4.6	2.1	2	2.6
U	0.317	n.d.	0.673	<0.05	0.2	0.43	<0.2	<0.05	<2	<2	<3	<2	<2

*Major elements normalized to 100 percent, less H_2O and CO_2; n.d. = not determined.

SAMPLE DATA FOR TABLE 17

Sample Number	Collection Number	Quadrangle*	Lithology	Latitude	Longitude
1	85APr162C	CO C-5	Basalt, (Tovs? calc tuff-breccia)	60°34'03"	145°34'32"
2	83APr312	CO D-8	Gabbro	6058'06"	146°43'01"
3	83APr311A	CO D-8	Basalt (pillow)	60°55'09"	146°40'09"
4	85BC004	CO C-6	Basalt (pillow)	60°38'35"	146°07'15"
5	83APr315	VA A-8	Metabasalt	61°01'09"	144°47'05"
6	85APr161	CO C-5	Basalt	60°33'23"	145°45'08"
7	73ATz137	CO B-2	Andesite	60°17'00"	144°34'00"
8	85APr98	CO A-2	Basalt (pillow)	60°10'37"	144°35'09"
9	73AH205A	CO B-2	Metabasalt	60°18'00"	144°32'00"
10	73AH202A	CO A-2	Metabasalt	60°12'00"	144°33'00"
11	73AH186A	CO B-2	Metabasalt	60°17'00"	144°34'00"
12	73AH206A	CO B-2	Basaltic andesite	60°19'00"	144°35'00"
13	73AH201A	CO A-2	Metabasalt	60°13'00"	144°32'00"

*CO = Cordova; VA = Valdez.