TABLE 1.—*Analyses of volcanic rocks of the Portage Lake Volcanics, Isle Royale*

[Chemical analyses made by a single-solution procedure (Shapiro, 1967). Analysts: P. L. D. Elmore, Lowell Artis, S. D. Botts, Gillison Chloe, J. L. Glenn, James Kelsey, and Hezekiah Smith (rept. 68 WRC 26). Results of semiquantitative spectrographic analyses are reported to the nearest number in the series 1, 0.7, 0.5, 0.3, 0.2, 0.15, and 0.1, which represent approximate midpoints of interval data on a geometric scale. The assigned interval for semiquantitative results will include the quantitative value about 30 percent of the time. Analyst: Chris Heropoulos (rept. 68 MS–38). Looked for but not found: Ag, As, Au, Bi, Cd, Ge, Hf, Hg, In, Li, Mo, Pd, Pt, Re, Sb, Sn, Ta, Te, Th, Tl, U, W, Zn]

Rock type	Ophite				Columnar trap		Fine-grained porphyrite		Coarse-grained porphyrite	Trap		Pegmatite	
Stratigraphic unit	Undivided	Hill Point Flow	Undivided	Greenstone Flow	Edwards Island Flow	Greenstone Flow	Scoville Point Flow	Tobin Harbor Flow	Huginnin Flow	Minong Flow	Amygdaloid Island Flow	Undivided	Greenstone Flow
Field No.	IR–11A	IR–66	IR–15	IR–70A	IR–23	IR–74	IR–22B	IR–36	IR–60A	IR–40	IR–49	IR–32	IR–71B
Chemical analyses (weight percent)													
SiO_2	44.7	47.1	47.4	47.6	47.1	48.5	49.2	48.5	52.7	52.5	56.6	49.6	50.0
Al_2O_3	16.3	16.1	16.1	16.2	17.7	16.2	17.2	16.9	13.0	14.9	12.7	12.1	14.7
Fe_2O_3	5.6	5.3	10.2	3.9	3.1	4.9	6.4	5.2	4.6	4.1	9.8	10.4	5.9
FeO	6.5	6.3	3.4	6.6	5.2	5.4	4.2	6.2	8.2	7.4	3.5	3.4	5.4
MgO	7.5	7.0	5.9	7.3	8.2	7.3	4.8	4.6	4.8	5.5	2.7	3.7	5.5
CaO	8.8	10.2	9.0	11.1	10.9	9.8	9.5	8.4	5.5	7.2	3.0	12.3	8.1
Na_2O	2.4	2.4	2.3	2.5	1.8	2.2	3.6	3.6	3.8	3.2	3.2	2.6	3.7
K_2O	.52	.35	.45	.18	.13	.14	.96	1.3	.28	1.3	2.9	.12	1.2
H_2O^-	1.8	.81	.71	1.3	2.2	2.2	.34	.54	.91	.45	.74	.06	.53
H_2O^+	3.6	2.4	2.0	1.7	1.9	1.6	1.9	2.3	3.2	1.8	1.9	1.7	2.5
TiO_2	1.9	1.5	2.2	1.3	.93	1.4	1.5	2.1	2.3	1.7	2.0	3.3	2.1
P_2O_5	.29	.20	.34	.14	.08	.15	.16	.26	.39	.29	.71	.43	.20
MnO	.16	.18	.10	.16	.15	.16	.16	.16	.15	.15	.18	.18	.13
CO_2	<.05	<.05	<.05	<.05	.31	<.05	.08	<.05	<.05	<.05	<.05	<.05	<.05
Sum	100	100	100	100	100	100	100	100	100	100	100	100	100
Semiquantitative spectrographic analyses													
B	.....	.....	.....	.....	.....	.....	0.003	0.001	0.001	.....	0.001	0.002	0.002
Ba	0.015	0.015	0.015	0.015	0.005	0.01	.02	.03	.015	0.03	.07	.002	.05
Be	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.0003	.....	.....
Ce	.....	.....	.....	.....	.....	.....	.....	.....	.01	.....	.015	.....	.....
Co	.005	.005	.005	.007	.005	.005	.005	.005	.005	.005	.003	.003	.005
Cr	.01	.02	.007	.03	.03	.02	.02	.015	.003	.01	.....	.007	.02
Cu	.02	.02	.03	.01	.01	.015	.007	.007	.03	.02	.02	.07	.015
Ga	.0015	.0015	.0015	.0015	.001	.0015	.0015	.0015	.0015	.0015	.002	.0015	.0015
La	.....	.....	.....	.....	.....	.....	.....	.....	.007	.005	.01	.003	.....
Nb	.002	.0015	.002	.0015	.....	.0015	.0015	.0015	.003	.0015	.005	.002	.002
Ni	.02	.02	.02	.02	.03	.03	.007	.007	.007	.015	.0003	.005	.005
Pb	.....	.....	.....	.....	.....	.....	.....	.003	.001	.001	.001	.....	.....
Sc	.003	.005	.003	.005	.005	.003	.005	.005	.005	.003	.003	.005	.005
Sr	.07	.05	.03	.03	.03	.05	.05	.07	.015	.05	.015	.05	.05
V	.03	.02	.03	.03	.02	.02	.03	.03	.03	.02	.007	.05	.05
Y	.005	.003	.005	.005	.002	.005	.003	.007	.007	.005	.01	.007	.007
Yb	.0002	.0003	.0004	.0005	.0002	.0005	.0003	.0005	.0007	.0007	.001	.0007	.0007
Zr	.01	.007	.015	.015	.005	.01	.01	.02	.02	.02	.05	.02	.015
Nd	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.01	.....	.....
CIPW norms (weight percent)													
Q	.....	.....	3.4	.....	1.2	3.3	.....	.....	9.7	4.8	14.8	8.2	.....
or	3.3	2.1	2.7	1.1	.8	.9	5.8	7.9	1.7	7.8	17.7	.7	7.3
ab	21.5	21.1	20.1	21.8	15.9	19.4	31.3	31.4	33.6	27.6	28.0	22.6	32.4
an	34.0	33.3	33.3	33.5	41.7	35.3	28.7	26.9	18.4	22.9	10.6	21.6	20.6
di	8.2	14.4	8.5	18.1	9.9	11.5	14.8	11.7	6.1	9.4	.....	31.3	15.9
wo	(4.2)	(7.4)	(4.4)	(9.3)	(5.1)	(6.0)	(7.6)	(6.0)	(3.1)	(4.8)	.....	(15.9)	(8.2)
en	(2.7)	(4.7)	(2.6)	(6.0)	(3.6)	(3.9)	(4.4)	(3.4)	(1.7)	(2.9)	.....	(8.5)	(5.0)
fs	(1.2)	(2.3)	(1.6)	(2.7)	(1.2)	(1.6)	(2.8)	(2.3)	(1.3)	(1.7)	.....	(6.9)	(2.7)
hy	16.2	19.4	20.2	15.1	23.5	21.3	5.7	6.4	18.5	17.9	16.4	1.6	12.7
en	(11.1)	(13.0)	(12.6)	(10.4)	(17.8)	(15.0)	(3.5)	(3.9)	(10.8)	(11.1)	(7.0)	(.9)	(8.3)
fs	(5.0)	(6.5)	(7.6)	(4.6)	(5.7)	(6.3)	(2.2)	(2.5)	(7.7)	(6.8)	(9.4)	(.7)	(4.4)
C	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.6	.....	.....
mt	6.1	5.7	6.5	5.2	4.2	5.1	5.1	5.6	6.4	5.6	6.4	6.5	5.5
il	3.8	3.0	4.3	2.5	1.8	2.8	2.9	4.1	4.6	3.3	3.9	6.4	4.1
ol	6.2	.5	.....	2.4	.....	.....	5.2	5.4	.....	.....	.....	.....	.9
fo	(4.1)	(.3)	.....	(1.6)	.....	.....	(3.1)	(3.2)	.....	.....	.....	.....	(.6)
fa	(2.1)	(.2)	.....	(.8)	.....	.....	(2.2)	(2.3)	.....	.....	.....	.....	(.3)
ap	.7	.5	.8	.3	.2	.4	.4	.6	1.0	.7	1.7	1.0	.5
cc	.....	.....	.....	.....	.7	.....	.2	.....	.....	.....	.....	.....	.....
Sum	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Normative plagioclase (percent an)	61.3	61.3	62.5	60.6	72.5	64.5	47.9	47.0	35.4	45.4	27.5	48.9	38.9
Normative color index	41.2	43.5	40.5	43.6	40.4	41.1	34.2	33.8	36.6	36.9	28.9	47.9	39.7

IR–11A. South shore of Raspberry Island.
IR–66. North side of Hill Point.
IR–15. South shore of West Caribou Island.
IR–70A. North side of Blake Point near The Palisades.
IR–23. North shore of Edwards Island.
IR–74. South shore of Merritt Island.
IR–22B. South shore of Edwards Island.
IR–36. North shore of Tobin Harbor near Fire Island.
IR–60A. Small point on west side of Lane Cove.
IR–40. East end of most northwesterly point on main island, 1 mile west of Locke Point.
IR–49. South shore at east end of Amygdaloid Island.
IR–32. Shoreline near Mine Point, south of Conglomerate Bay.
IR–71B. On end of Blake Point near lighthouse.