Table 1: Lava Flow and Averaged Electron Microprobe Glass Analyses.

Oxide	HI03 R	HI03 G	HI03 I	HI02 R	HI02 G	HI02 I
SiO_2	48.06	50.31	50.89	47.84	50.13	50.16
TiO_2	2.05	3.17	2.39	2.01	2.84	2.16
Al_2O_3	11.32	12.92	13.97	11.00	13.24	13.55
Fe_2O_3	1.06			1.02		
FeO	10.92	11.62	9.97	10.98	11.52	10.72
MnO	0.18			0.18		
MgO	15.09	6.05	6.23	15.44	7.03	7.07
CaO	9.08	10.80	11.89	8.97	11.25	11.4
Na_2O	1.81	2.54	2.45	1.81	2.49	2.42
K_2O	0.41	0.61	0.50	0.41	0.52	0.49
P_2O_5	0.20	0.30	0.27	0.32*	0.26	0.26
Total	100.18	98.32	98.56	99.89	99.28	98.23

Rock analyses from Wright, 1971 and Wright, *et al.*, 1975. R = rock, G = glass, I = glass inclusions in olivine phenocrysts. Mn not analyzed in glasses. All Fe reported as FeO in glasses. Rock analyses from Wright, 1971 and Wright, *et al.*, 1975. Glass analyses from Nicholls and Stout, 1988. * This value for P_2O_5 is inconsistent with the microprobe analyses of the glasses and minerals because it is larger than the concentration measured in any of the phases in the rock.

Table 1, cont.: Lava Flow and Glass Analyses

Oxide	HI14 R	HI14 G	HI12 R	HI12 G	HI12 I	HM04 R
SiO_2	48.90	50.97	49.31	50.21	50.89	50.48
TiO_2	2.29	3.39	2.37	2.81	2.57	2.69
Al_2O_3	12.06	13.31	12.49	13.29	13.70	13.52
Fe_2O_3	1.73		1.08			1.49
FeO	9.99	12.37	10.48	10.75	10.53	9.95
MnO	0.17		0.17			0.17
MgO	12.27	5.80	11.04	7.27	5.98	7.41
CaO	9.86	10.56	10.21	11.13	11.40	11.08
Na_2O	1.99	2.70	2.12	2.39	2.52	2.31
K_2O	0.45	0.60	0.47	0.52	0.51	0.52
P_2O_5	0.23	0.32	0.24	0.26	0.30	0.28
Total	99.94	100.02	99.98	98.63	98.40	99.90

Rock analyses from Wright, 1971 and Wright, *et al*., 1975. R = rock, G = glass, I = glass inclusions in olivine phenocrysts. Mn not analyzed in glasses. All Fe reported as FeO in glasses. Rock analyses from Wright, 1971 and Wright, *et al*., 1975. Glass analyses from Nicholls and Stout, 1988

Table 1, cont.: Lava Flow and Glass Analyses

Oxide	HM12 R	HM67 R	HM02 R	HM15 R	HM15 G
SiO_2	50.24	50.24	50.18	50.25	50.35
TiO_2	2.62	2.65	2.57	2.62	3.72
Al_2O_3	13.7	13.56	13.63	13.61	12.56
Fe_2O_3	1.61	1.36	1.66	1.49	
FeO	9.77	9.95	9.72	9.86	13.28
MnO	0.17	0.17	0.17	0.17	
MgO	7.58	7.59	7.63	7.63	5.63
CaO	11.17	11.06	11.02	11.14	9.92
Na_2O	2.29	2.31	2.25	2.32	2.65
K_2O	0.53	0.54	0.54	0.55	0.70
P_2O_5	0.25	0.26	0.25	0.26	0.36
Total	99.93	99.69	99.62	99.9	99.17

Rock analyses from Wright, 1971 and Wright, *et al.*, 1975. R = rock, G = glass, I = glass inclusions in olivine phenocrysts. Mn not analyzed in glasses. All Fe reported as FeO in glasses. Rock analyses from Wright, 1971 and Wright, *et al.*, 1975. Glass analyses from Nicholls and Stout, 1988.

Table 2: Maximum percent partial melting of pyrolite to produce the lava flow compositions.

SNo	HI02	HI03	HI14	HI12	HM04	HM02	HM12	HM67	HM15
%	26.13	30.14	26.13	25.07	21.46	23.96	24.04	23.07	23.11
0 Oxd	P_2O_5	P_2O_5	P_2O_5	P_2O_5	P_2O_5	P_2O_5 K_2O	P_2O_5 K_2O	P_2O_5	P_2O_5 K_2O
CPX	0.83	0.39	0.55	0.54	0.72	0.43	0.38	0.52	0.50
OLV	18.07	19.63	19.30	19.28	19.01	19.99	20.00	19.60	19.57
OPX	3.44	3.07	3.04	3.07	2.97	2.77	2.82	2.89	2.93
SPN	0.53	0.17	0.31	0.31	0.44	0.21	0.19	0.29	0.53

Table 3: Results: Differentiating from 1968 HI14 To 1968 HM04

Phase	Amount as Wt Pct of Init Magma	Amount as Wt Pct of All Phases	Amount as Wt Pct of Added Phs	Amount as Wt Pct of Subt Phs
Fo	-10.49	53.72	0.00	53.72
Fa	-3.30	16.89	0.00	16.89
PL14	-3.60	18.45	0.00	18.45
CP14	-2.14	10.94	0.00	10.94
Sum of Squares of Residuals = 0.017				
Sum of Squares of Residuals/(M - N) = 0.004				

Phase	Amount as Wt Pct of Init Magma	Amount as Wt Pct of All Phases	Amount as Wt Pct of Added Phs	Amount as Wt Pct of Subt Phs
Fo	-10.09	80.77	0.00	80.77
Fa	-2.40	19.23	0.00	19.23
Sum of Squares of Residuals = 0.167				
Sum of Squares of Residuals/(M - N) = 0.028				

Init = initial, Phs = phases. (M - N) is the number of oxides (M) minus the number of phases in the fractionation model (N). The sum of the squares of the residuals is the sum of the squares of the differences between the observed and calculated differences in oxide percentages between the initial and derivative magmas See Part 2 of the e-text, *Mass Balance Constraints*.

Table 4: Results of testing crystal fractionation in the picrites and olivine tholeiite from the 1968 eruptions.

Transition	Obs % Fo	Calc % Fo	Wt % Olivine	S/(M - N)
HI02 ⇒ HI03	86.2 - 82.1	82.8	1.43	0.004
HI03 ⇒ HI14	87.0 - 81.2	84.0	8.45	0.018
HI14 ⇒ HI12	87.6 - 78.3	84.2	3.59	0.001
HI12 ⇒ HM04	87.4 - 80.4	86.2	9.23	0.024

Olivine compositions in Mole % Fo. Range in observed compositions from Nicholls and Stout, 1988. S/(M - N) is the sum of the squares of the residuals be-tween the observed and calculated differences in oxide percentages between the initial and derivative magmas divided by the number of oxides (M) minus the number of phases (N) in the fractionation model. See Part 2 of the e-text, *Mass Balance Constraints.*

Table 5: Olivine + Orthopyroxene Saturation Conditions: 1968 Lava Flows

Sample	P(GPa)	T°C	X_{Fo}	X_{En}
HI02	0.7462	1427	0.8906	0.9214
HI03	0.7198	1417	0.8886	0.9198
HI14	0.5172	1336	0.8749	0.9084
HI12	0.5339	1313	0.8565	0.8953
HM04	0.3477	1195	0.8039	0.8561
HM02	0.3777	1203	0.8130	0.8627
HM12	0.3644	1199	0.8107	0.8609
HM67	0.3761	1205	0.8079	0.8592
HM15	0.3877	1204	0.8106	0.8611

Table 6: Calculated plagioclase compositions that first join olivine on fractionation paths for melts that originate with HI14

P (GPa)	X_{An} (Calculated)
0.1	0.7159
0.2	0.7038
0.3	0.6924

Table 7: Interpolated pressures where plagioclase with the compositions of the microphenocrysts cores would join olivine on fractionation curves

Sample	P (GPa)	X_{An} (Cores)	T°C
HI14	0.24	0.7000	1188
HM04	0.17	0.6973	1176
HM02	0.34	0.6925	1186
HM12	0.35*	0.6812	1194
HM15	0.27	0.6942	1184

The interpolation procedure predicts a pressure of 0.37 GPa. However, at 0.37 GPa, orthopyroxene, not plagioclase is the 2nd phase on the fractionation path. At 0.35 GPa, the predicted plagioclase composition is .An68.47.