Table 23. *Electron microprobe analyses of clinopyroxenes and orthopyroxenes from selected wet runs*

Composition	High-alumina quartz tholeiite											Dacite
Conditions of run	10 kb 920° C $7^1/_2$ hrs Wet	10 kb 960° C 4 hrs Wet	9 kb 1,040° C 4 hrs Wet	9 kb 1,040° C 4 hrs Wet	10 kb 920° C $7^1/_2$ hrs Wet	10 kb 960° C 4 hrs Wet	9 kb 1,040° C 4 hrs Wet	9 kb 1,040° C 4 hrs Wet	10 kb 960° C 4 hrs Wet	10 kb 940° C 6 hrs Wet	10 kb 960° C 4 hrs Wet	27 kb 1,100° C 60 mins Wet
	Runs conducted in platinum capsules,				Analyses adjusted for iron loss				Runs conducted in graphite capsules			
Co-existing phases	amph[b], opx plag[b]	amph[b], opx	amph[b], opx[b]	amph[b], cpx[b]	amph[b] opx, plag[b]	amph[b], opx	amph[b], opx[b]	amph[b] cpx[b]	opx[b] ilm	amph[b], opx, ilm	cpx[b], ilm	ga[b]
SiO_2	47.2	48.0	47.3	47.5	46.7	47.5	46.8	46.3	51.7	52.0	49.4	50.0[a]
TiO_2	1.6	1.6	1.7	0.8	1.6	1.6	1.7	0.8	1.2	0.9	0.6	0.6
Al_2O_3	10.0	10.6	8.6	7.5	9.9	10.5	8.5	7.3	9.2	11.3	8.4	15.0
FeO	7.0	6.1	5.8	11.8	9.0	7.9	7.6	15.4	6.4	8.3	11.1	6.2
MgO	11.6	11.9	14.9	26.6	10.5	10.9	13.9	24.5	13.6	13.8	27.9	9.0
CaO	21.6	18.7	20.1	1.7	21.4	18.5	19.9	1.7	19.7	19.8	1.4	15.9
Na_2O	0.7	0.7	0.6	—	0.7	0.7	0.6	—	0.1	0.2	—	2.7[a]
	99.7	97.6	99.0	95.9	99.8	97.6	99.0	96.0	101.9	106.3	98.8	99.4
$\frac{100\,Mg}{Mg+Fe}$	74.7	77.7	82.1	80.1	67.5	71.1	76.5	73.9	79.1	74.8	81.7	72.1
Formula 6 [0]												
Si, Al $\}z$	1.7543 0.2457	1.7922 0.2078	1.7567 0.2433	1.7722 0.2278	1.7500 0.2500	1.7888 0.2112	1.7532 0.2468	1.7588 0.2412	1.8430 0.1570	1.7904 0.2096	1.7754 0.2246	1.8156 0.1844
Al, Ti, Fe, Mg, Ca, Na $\}x+y$	0.1921 0.0447 0.2176 0.6428 0.8600 0.0505	0.2585 0.0448 0.1905 0.6626 0.7479 0.0507	0.1330 0.0475 0.1801 0.8252 0.7998 0.0433	0.1018 0.0224 0.3682 1.4800 0.0679 —	0.1874 0.0450 0.2822 0.5867 0.8593 0.0509	0.2586 0.0453 0.2490 0.6122 0.7465 0.0512	0.1283 0.0480 0.2382 0.7765 0.7985 0.0437	0.0857 0.0228 0.4892 1.3878 0.0692 —	0.2295 0.0321 0.1909 0.7231 0.7525 0.0068	0.2490 0.0234 0.2386 0.7086 0.7303 0.0132	0.1313 0.0162 0.3337 1.4952 0.0540 —	0.4577 0.0164 0.1884 0.4874 0.6185 0.1899
z	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
$x+y$	2.01	1.96	2.03	2.04	2.01	1.96	2.03	2.05	1.94	1.96	2.03	1.96
AT. PROP.												
Mg	37.4	41.4	45.7	77.3	34.0	38.1	42.8	71.3	43.4	42.2	79.4	37.7
Fe	12.6	11.9	10.0	19.2	16.3	15.5	13.1	25.1	11.5	14.2	17.7	14.6
Ca	50.0	46.7	44.3	3.5	49.7	46.4	44.1	3.6	45.1	43.6	2.9	47.8

[a] Denotes estimated content; reliable analytical figure not obtained. [b] Denotes co-existing phase analyzed.

Table 24. *Electron microprobe analyses of amphiboles from selcted wet runs on the high-alumina quartz tholeiite composition*

Conditions of run	10 kb 920° C $7^1/_2$ hrs Wet	10 kb 960° C 4 hrs Wet	9 kb 1,040° C 4 hrs Wet	9 kb 1,040° C 4 hrs Wet	10 kb 960° C 4 hrs Wet	10 kb 920° C $7^1/_2$ hrs Wet	10 kb 940° C 6 hrs Wet	10 kb 920° C $5^1/_2$ hrs Wet
	Runs conducted in platinum capsules			Analyses adjusted for iron loss to platinum capsules			Runs conducted in graphite capsules	
Co-existing phases	cpx[a], opx, plag[a]	cpx[a], opx	cpx[a], opx[a]	cpx[a] opx[a]	cpx[a], opx	cpx[a], opx, plag[a]	cpx[a], opx, mt	cpx[a], opx, mt
SiO_2	40.5	40.8	39.8	39.3	40.2	39.9	40.0	40.2
TiO_2	2.9	2.8	3.9	3.8	2.8	2.9	3.0	3.1
Al_2O_3	15.8	14.4	15.8	15.6	14.2	15.6	14.8	15.4
FeO	10.0	8.2	7.6	9.8	10.6	12.6	9.4	9.8
MgO	13.1	14.9	14.9	13.7	13.6	11.6	12.9	12.1
CaO	12.4	11.7	12.0	11.8	11.5	12.2	11.6	11.8
Na_2O	2.5	2.7	2.9	2.9	2.7	2.5	2.0	1.8
K_2O	0.4	0.4	0.2	0.2	0.4	0.4	0.3	0.3
	97.6	95.9	97.1	97.1	96.0	97.7	94.0	94.5
$\frac{100\,Mg}{Mg+Fe}$	70.3	76.4	77.8	71.4	69.6	62.1	71.0	68.8
Structural Formulae-calculated on "dry" basis of 23 [0] since H_2O content could not be determined								
z Si	5.932	6.025	5.802	5.790	6.002	5.909	6.288	6.039
z Al	2.068	1.975	2.198	2.210	1.998	2.091	1.712	1.961
y Al	0.659	0.531	0.516	0.498	0.500	0.631	1.029	0.766
y Ti	0.320	0.311	0.427	0.422	0.314	0.323	0.354	0.350
y Fe	1.209	1.013	0.927	1.208	1.324	1.561	1.236	1.231
y Mg	2.862	3.281	3.239	3.011	3.029	2.561	3.024	2.710
x Ca	1.945	1.851	1.874	1.862	1.840	1.936	1.954	1.899
x Na	0.709	0.861	0.820	0.829	0.781	0.717	0.610	0.524
x K	0.074	0.075	0.037	0.037	0.075	0.075	0.060	0.058
z	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
y	5.05	5.14	5.11	5.14	5.17	5.08	5.64	5.06
x	2.73	2.79	2.73	2.73	2.70	2.79	2.62	2.48

[a] Denotes co-existing phase analyzed.

Marked iron enrichment is prevented by the large degree of crystallization of amphibole with a relatively high Fe/Mg ratio, counteracting the effects of crystallization of pyroxenes with low Fe/Mg ratios. With increasing crystallization of plagioclase in extreme cases of fractionation the K/Na ratio of the fractionating liquids will increase.

The results obtained for the fractional crystallization at moderate pressure of high-alumina quartz tholeiite, basaltic andesite, andesite and rhyodacite under wet conditions are directly applicable to fractional crystallization of a hydrous