

Table 9. Compositions of orthopyroxenes analyzed by electron microprobe. Fe, Ca, Al determined by direct analysis, other components calculated assuming ideal orthopyroxene composition

	Olivine tholeiite										Olivine basalt			Alkali olivine basalt
Pressure (kb)	9.0	9.0	9.0	13.5	13.5	13.5	13.5	13.5	18.0	18.0	13.5	18.0	18.0	13.5
Temp. (°C)	1,290	1,270	1,250	1,400	1,380	1,350	1,310	1,290	1,420	1,400	1,320	1,340	1,335	1,290
SiO <sub>2</sub>	54.5	53.9	52.9	55.9	54.4	53.8	52.5	53.1	54.9	53.4	53.8	51.8	54.3	50.6
Al <sub>2</sub> O <sub>3</sub>	4.9	5.4	6.9	3.8	5.7	6.0	7.8	6.4	5.1	7.3	6.4	10.0	5.9	10.6
FeO	7.8	8.3	9.1	5.5	6.5	7.2	8.7	9.7	5.8	6.4	6.6	6.5	6.4	9.7
MgO	30.0	29.6	28.5	32.8	31.2	30.2	28.3	28.3	32.0	30.4	30.3	29.5	30.8	26.6
CaO	2.9	2.8	2.6	2.0	2.2	2.8	2.7	2.5	2.2	2.5	2.9	2.2	2.6	2.5
100 Mg Mg + Fe (mol)	87.3	86.4	84.9	91.4	89.6	88.2	85.3	83.9	90.8	89.5	89.1	89.0	89.6	83.0
<i>Mol. Proportions</i>														
Ens	78.1	77.0	74.4	84.5	80.6	78.1	74.1	74.2	82.5	78.6	78.4	76.2	79.8	69.9
Fs	11.3	12.1	13.3	8.0	9.4	10.5	12.7	14.3	8.3	9.2	9.6	9.4	9.3	14.3
Wo	5.5	5.3	5.0	3.7	4.2	5.2	5.1	4.8	4.0	4.7	5.4	4.2	4.8	4.8
Al <sub>2</sub> O <sub>3</sub>	5.1	5.6	7.3	3.8	5.8	6.2	8.1	6.7	5.2	7.5	6.6	10.2	6.1	11.0
<i>Coeexisting Crystalline phases</i>														
	Ol*	Ol*	Ol* + Cpx	Nil	Nil	Cpx	Cpx*	Cpx + Sp**	Nil	Cpx*	Nil	Nil	Cpx*	Cpx*

\* Denotes crystalline phase analyzed by electron microprobe.

\*\* Spinel has approximately 14% FeO, 70 ± 5% Al<sub>2</sub>O<sub>3</sub> < 1.3% CaO.(Calculated composition assuming FeAl<sub>2</sub>O<sub>4</sub>, MgAl<sub>2</sub>O<sub>4</sub> solid solution 14% FeO, 67.3% Al<sub>2</sub>O<sub>3</sub>, 18.7% MgO.)

Table 10. Comparison of 100 Mg/Mg+Fe<sup>++</sup> values of liquidus olivine and liquidus orthopyroxene crystals

	Liquidus olivine			Liquidus orthopyroxene		
	Pressure (kb)	Temp. (°C)	100 Mg Mg+Fe <sup>++</sup>	Pressure (kb)	Temp. (°C)	100 Mg Mg+Fe <sup>++</sup>
Olivine Tholeiite	4.5	1350	92.2	13.5	1400	91.4
"    "	9	1350	90.9	18	1420	90.8
Olivine Basalt	9	1280	89.6	13.5	1320	89.1
"    "				18	1335	89.6
"    "				18	1340	89.0
Alkali Olivine Basalt	9	1260	83.0	13.5	1290	83.0

(10% Al<sub>2</sub>O<sub>3</sub>) run and the 1,335° C (5.9% Al<sub>2</sub>O<sub>3</sub>) run is not readily understood but may be an effect of the presence of aluminous clinopyroxene (9.9% Al<sub>2</sub>O<sub>3</sub>) in the 1,335° C run and its absence in the 1,340° C run.

The CaO content of the orthopyroxene is lower (2.0–2.2% CaO) in runs in which there is no co-existing clinopyroxene and increases to 2.5 or 2.8% CaO in these runs in which stable clinopyroxene occurs. This is shown by the olivine tholeiite runs at 13.5 kb and 18 kb and the olivine basalt runs at 18 kb but the olivine basalt 13.5 kb 1,320° C run and the 9 kb olivine tholeiite runs are exceptions to this generalization.

Table 11. Compositions of clinopyroxenes analyzed by electron microprobe. Fe, Ca, Al determined by direct analysis, other components calculated assuming ideal clinopyroxene composition and little or no Na or Ti substitution

	Olivine tholeiite		Olivine basalt	Alkali olivine basalt		
	Pressure (kb)	Temp. (°C)	Temp. (°C)	Analysis No.	Analysis No.	Analysis No.
Pressure (kb)	13.5	18.0	18.0	9.0	13.5	18.0
Temp. (°C)	1,310	1,400	1,335	1,220	1,290	1,320
Analysis No.	1	2	3	4	5	6
SiO <sub>2</sub>	49.3	52.3	50.7	49.4	49.2	49.1
Al <sub>2</sub> O <sub>3</sub>	11.3**	7.3	9.9	9.0	11.2	11.0
FeO	8.3	6.0	5.5	9.5	9.0	7.6
MgO	21.2	25.1	23.1	16.9	20.9	19.5
CaO	9.9	9.3	10.8	15.2	9.7	12.8
100 Mg Mg+Fe	82.1	88.2	88.2	76.1	80.6	82.1
<i>Mol. Proportions</i>						
Ens	56.5	66.0	61.0	46.1	56.0	52.5
Fs	12.4	8.8	8.1	14.5	13.5	11.3
Wo	19.1	17.6	20.6	29.5	18.6	24.6
Al <sub>2</sub> O <sub>3</sub>	12.0	7.6	10.3	9.9	11.9	11.6
<i>Coexisting</i>						
Crystalline phases	Opx*	Opx*	Opx*	Ol*	Opx*	Nil

\* Denotes crystalline phase analyzed by electron microprobe.

\*\* Doubtful value, possibly too high due to interference from glass. Crystals are very small.