

0% olivine' used in pressure assemblages

1	2
0.8	1.3
5.0	8.3
6.6	11.0
6.8	11.3
15.8	26.4
62.5	37.5
1.3	2.2
0.7	1.1
0.6	1.0

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of Fo + An (1 : 1  
iro & Yoder 1966  
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eding with pyrox-  
e been metastable.  
ait a much smaller  
rance of garnet in  
used (Fo + An)  
ed some runs with  
olage is metastable  
.e.:

mix)

Cpx<sub>ss</sub> + Opx<sub>ss</sub> +  
(1966, Figs. 1 & 2,  
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s at 1175°C, 18 kb,  
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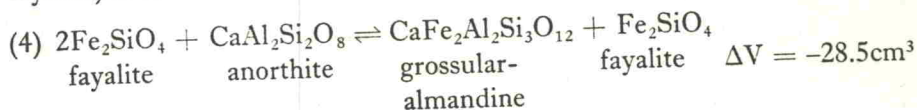
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*Fayalite + Anorthite (Table 2)*

Melting occurs in the Fe-rich system at much lower temperatures than in the Mg-rich system so that experiments were run only at 1100°C, 1050°C, and 900°C. In the 1100°C runs there was minor melting at pressures above 8 kb and a large amount of melting at 7.2 kb. Using a mix of glass + 10% seed (garnet + fayalite), garnet increased in amount in the 8.1 kb run. In the unseeded mixes garnet crystallized from glass and from crystalline (An + Fa) mix at 9 kb, 1100°C, but was absent at 8.1 kb, 1100°C. Neither magnetite, pyroxene nor metallic iron was observed in any of the runs, and residual or excess fayalite was present in all runs.

At 1050°C the problems of minor melting were avoided, and garnet disappeared from the seeded mix in the run at 6.3 kb, formed a major phase at 8.1 kb, and a minor phase in both the 7.2 kb, 3 hr and 7.2 kb, 24 hr runs. The coarser grain size of the garnet in the 24 hr run compared with that in the 3 hr run is taken to indicate stability of this phase, but also run conditions very close to the reaction boundary.

At 900°C, run times were of 24 hrs, and in one case, of 88 hrs. Seeded mixes were used in all cases. The marked increase in garnet in the 7.2 kb and 8.1 kb runs contrasts with its decrease and corroded nature at 5.4 kb, and the decrease in the 88 hr run at 6.3 kb. Knowledge of the bulk composition and the observation that pyroxene or spinel do not occur amongst the products in any of the subsolidus runs, shows that the reaction occurring to yield garnet (assuming no significant larnite solid solution in fayalite) is as follows:



The specific garnet composition was confirmed by determination of  $a_0$  (11.64 ± .01 Å) and refractive index (1.800 ± .005).

*Olivine + Labradorite*

Unlike the end member anorthite, reaction between labradorite and olivine is controlled by coupled reactions involving changes in plagioclase solid solution and will occur over a range of pressures at a given temperature. Kushiro (1965a) has presented preliminary data in the system forsterite + nepheline + silica suggesting that forsterite + albite is stable up to approximately 11 kb at 1100°C, but is replaced by nepheline + enstatite and then by enstatite + jadeite at higher pressures (reactions (5) & (6)).

