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Correction to the paper "Compositional variations of coexisting phases with degree of melting of peridotite in the upper mantle" by B. O. Mysen and I. Kushiro[1]

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Mysen and Kushiro (1977) determined the melting behavior of volatile-free peridotite nodule 1611 at 20 and 35 kbar. They showed that, except for the first 2 percent fusion, temperature and compositions of coexisting phases change only a small amount as long as olivine, orthopyroxene, and clinopyroxene are all present. Thus, the melting behavior may be thought of in an approximate way as invariant. This type of melting behavior was originally suggested for mantle materials by Yoder and Tilley (1962, p. 519) and has been further discussed by Presnall (1969). Mysen and Kushiro also showed that as fusion proceeds, each mineral assemblage defines a distinct slope in a temperature versus percent fusion plot (Figs. 1, 2, and 3 in Mysen and Kushiro, 1977). When reporting compositions of liquids, however, they incorrectly stated (p. 855) ". . . only three liquid compositions can be obtained by partial melting of volatile-free spinel peridotite—olivine tholeiite, picrite, and peridotitic komatiite. Within the stability field of garnet peridotite there are four types of liquids—alkali picrite, olivine tholeiite, picrite, and peridotitic komatiite."

Presnall (1969) has shown that the liquid path can be compositionally discontinuous during fractional fusion, but must be compositionally continuous during equilibrium fusion. Because the experiments of Mysen and Kushiro (1977) represent equilibrium fusion, the liquid paths determined by them must be continuous. Consequently, the compositional jumps in their plots of weight percent oxide versus percent melt (their Fig. 9) should not exist, and liquid compositions intermediate between those stated must occur. The curves in their Figure 9 should, however, show a change in slope at points where one crystalline phase disappears.

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