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Mineral composition and isotope geochemistry of Mamonia peridotites (Cyprus).

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Spinel lherzolites of the Mamonia complex (Cyprus) display strong correlations between the petrological and geochemical parameters indicative of melting degrees (e.g. Fo content of olivine, Cr# of Cr-spinel, Al and Yb in clinopyroxene). The degree of partial melting experienced by these peridotites is estimated from the composition of Cr-spinel to range from 1-9 %. The composition of clinopyroxene from spinel lherzolite poses extreme depletion in LREE, suggested effective melt extraction.

The abundances of the platinum-group elements (PGE) in the spinel lherzolites are correlated with each other, as well as with the degree of partial melting. The PGE show compatible behavior during melting, consistent with a presence of residual monosulfide phases. However, the recorded PGE enrichment with increasing degree of partial melting is much higher than allowed by fractional melting models, and this requires more complex melting models.

The Os isotopic composition of the spinel lherzolites varies over a wide range (187Os/188Os: 0.122-0.133) and the Re depletion ages suggest a Proterozoic melting event. The correlation between 187Os/188Os ratios and the degree of partial melting allowed the calculation of present day 187Os/188Os ratio of the Mamonia unmelted mantle peridotite as 0.1302. This is a more radiogenic composition than the DMM estimations, but close to the value estimated for the primitive mantle.

Spinel harzburgites of the Mamonia complex show no correlation between Fo content

of olivine and Cr# of Cr-spinel. The PGE abundances in the studied spinel harzburgites, as well as their $^{187}Os/^{188}Os$ ratios, also do not correlate with the inferred degrees of partial melting. Therefore, these harzburgites are not simply melting residues, but have likely interacted with percolating melts.