**Origin of Dunite Xenoliths in Laiwu High-Mg Diorites from Western Shandong Based on the Abundance of Platinum Group Elements**

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Peridotite xenoliths are abundant in late Mesozoic high-Mg diorites in Laiwu, western Shandong province, and are composed mostly of dunites (> 95 vol%) with minor harzburgites (< 5 vol%). The occurrences of these xenoliths, their petrological and mineralogical characteristics are well documented by Xu et al. (2008; EPSL, 265: 123-137). We determined the abundance of chalcophile and siderophile elements in dunite to evaluate its origin.
The dunites contain high concentrations of Cr (> 3800 ppm), Co (>110 ppm) and Ni (>1680 ppm) in bulk rocks, high Mg olivine (Fo = 90-94) and high Cr chromite (Cr# =0.77-0.83). They contain low Ir-type PGE (Os+Ir+Ru < 4.8 ppb) and show high ratios of Pt-type /Ir-type PGE (2.1-21.7). Harzburgite samples contain high Cr (2640-3430 ppm), Co (103-111 ppm), Ni (2210-2400 ppm) and high Ir-type PGE (Os+Ir+Ru = 13.96-17.82 ppb) in bulk rocks, variable Mg in olivine (Fo = 88-93) and moderate Cr in Cr-spinel (Cr# =0.40-0.60), and low ratios of Pt-type /Ir-type PGE (0.16-0.32). Both dunites and harzburgites contain low Cu (< 5 ppm) and S (< 30 ppm). The compositions of bulk rocks and mineral chemistry suggest that the harzburgites are residue after high degrees of influx partial melting, and that the dunites are cumulates of melt. Considering that dunites are abundant and show similar Sr, Nd and Pb isotope compositions as Mg-diorite (Xu et al., 2008), dunites share their parental magmas with the hosting diorites. The foliation and opaqueness of dunites in hand-specimen due to abundant fluid inclusions suggest that they have undergone infiltration of H2O-rich fluids. The petrography of dunites, together with mineral chemistry of olivine and chromite, supports an earlier proposal that they formed in a subduction zone during the Mesozoic time (Xu et al., 2008).
Our data suggest that although the late Mesozoic SCLM beneath western Shandong province was intensely modified by the parental magma for high-Mg diorites, the mantle residues still keep the Ir-type PGE abundance as observed in many other refractory mantles, and that the resulting melt may become increasingly Mg-enriched and from which dunites crystallized as evidenced by the high Mg# in olivine and low total PGE abundance and high ratios of Pt-type/Ir-type PGE in the bulk composition of dunites.

Key words: late Mesozoic; subduction zone; PGE; high-Mg diorite; dunite; co-genetic cumulate.

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