

PLATINUM-RICH CHROMITITES IN ARC-ROOT COMPLEXES: AN EXAMPLE FROM NW SPAIN

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Chromitites with up to 13,400 ppb of total PGE occur in layered dunites within a HP granulite-eclogite-ultramafic suite stacked over the Gondwanan margin in NW Spain. The high grade suite is separated from the underlying continent by meta-ophiolite. The PGE-bearing layered dunites occur as two main units sandwiching a layered pyroxenite. This (crustal) layered complex rests upon a basal (mantle) harzburgite with chromite-rich dunite pods. Pt, Pd and PPGE/IPGE all increase upwards in both dunite units, with a pronounced negative Ru-anomaly developing in the highest dunites where the most chromite and PGE-rich samples occur. Harzburgites always show flat patterns in chondrite diagrams, whereas dunitic pods in harzburgites have a distinctive negative slope with depletions in Pt and Pd. The repetition of dunite above and below pyroxenites in the layered intrusion, with both showing similar patterns in chromite and PGE chemistry, suggests magma replenishment during a multiple intrusion history. Both harzburgites and pyroxenites show Al-rich spinel locally partially replaced by garnet. High pressure conditions are further suggested by high values of Fe and Cr ($Cr\#0.6$) in chromitites, an abundance of garnet in some pyroxenite layers, and association with high pressure granulites (13kb) and eclogites (17kb). Chromite and PGE chemistries reveal close similarities with dunitic chromites in recognised magmatic arc-root settings such as the Jijal Complex in Pakistan and the Tonsina and Talkeena Complexes in Alaska. Discrimination diagrams define a new field for such arc-root complexes, partly overlapping with (but showing greater Fe+Ti enrichment than) ophiolites.