

FORMATION OF PODIFORM DUNITES IN THE LYCIAN PERIDOTITE NAPPES (AĞLA - KOYCEĞİZ, SW TURKEY)

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ABSTRACT

In this study, the whole-rock major oxides, trace elements and mineral chemistry of the Ağla peridotites (comprising host harzburgites and podiform dunites) are investigated to determine the formation mechanisms of the Ağla podiform dunites (SW Turkey). The whole-rock Al_2O_3 , CaO, and MgO contents (wt %) of the all Ağla peridotites indicate a marked depletion in these elements. Al_2O_3 (wt%) of ortho- and clino-pyroxenes, Cr# of spinels and the Fo component of olivines from Ağla peridotites support this trend with much higher degrees of depletion in the podiform dunites. The existence of reaction/replacement textures accompanying the primary mantle texture in the low to moderately depleted harzburgite host rock suggests reaction with a melt post-dating the first-stage partial melting that took place in a mid-ocean ridge setting. The boninitic affinity of the Ağla podiform dunites suggests that they are products of a Mg-rich melt influx into the already depleted harzburgite host. This kind of melt may be produced by partial melting of a depleted peridotite source caused by H_2O -rich fluids liberated from a subducted slab beneath a subduction zone. The low equilibration temperatures and higher $\Delta\log (fO_2)$ FMQ of Ağla harzburgites and podiform dunites support this consideration and indicate that this melt/rock interaction process occurred in a supra-subduction zone.