



Orthopyroxene refertilization in subduction environment.

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One of the most fascinating and controversial debate in Earth Science concerns the chemical and mineralogical modifications affecting the mantle during melts/fluids percolation. Particularly in subduction settings it is important to well constrain the role and extent of silica enrichment related to subducted slab dehydratation or melting. This topic is addressed in the present study where a new suite of mantle xenoliths from Estancia Sol de Mayo (ESM, Patagonia) are investigated and compared with other xenolith occurrences nearby. ESM peridotites are mainly represented by spinel-bearing protogranular harzburgites and dunites, with minor lherzolites and one wehrlite. They are devoid of modal metasomatic features, such as spongy cpx, reaction rims around spinel and/or orthopyroxene, glassy patches, as well as of any hydrous minerals. The most interesting petrographic features is one dunitic sample cut by a vein of orthopyroxene (secondary orthopyroxenes, opx2). These are texturally and chemically different from those belonging to the typical protogranular peridotites (primary opx, opx1). Opx1 have mg# ($MgO/MgO+FeO$, at%) between 88.02 and 92.76 and Al_2O_3 content varying between 1.37 and 2.97 wt% while opx2 in the vein presents a more restricted range of mg# values at about 90 (89.99-90.88) with a significantly higher Al_2O_3 content (3.02-3.52 wt%).

Similar opx veins were also found in two other Patagonian localities, Cerro Fraile (CF) and Gobernador Gregores (GG), together with orthopyroxenites and wehrlites. A comparison between the two generation of opxs from these localities show two clearly separated Al_2O_3 enrichment trends, which cannot be explained by a simple partial melting process: one at almost constant mg# with Al_2O_3 values varying from 1.33 and 4.20 wt% and the other reaching 5.03%wt of Al_2O_3 but with mg# varying from 86.89 to 67.37 (including the pyroxenites). Textural and chemical features suggest that the latter trend may be accounted for a refertilization process caused by a SiO_2 -oversaturated melt; the variable mg# values reflecting a different melt/rock ratios. It is under investigation if the first trend maybe derived from a similar process with peridotite matrix interacting with a compositionally different melt.