

## **Carbonated peridotite xenoliths from the mantle wedge: the Patagonia case**

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Carbonated spinel-facies mantle xenoliths up occur in the volcanic centre of Gobernador Gregores (Santa Cruz, Argentina). Peridotites are dominantly Iherzolites and subordinate harzburgites, wherlites and dunites, whose texture varies from secondary-protogranular to weakly foliated. The xenoliths document in full detail: a) the premetasomatic mineral assemblage; b) the metasomatic effects of an hydrous component inducing recrystallization of all the previous phases and pervasive amphibole, and rarely phlogopite, crystallization c) the effects of a late metasomatic episode operated by a carbonated component, which dramatically reacted with the phases of the hydrous metasomatism. Results of the last metasomatism are pockets and veins of silicate glass containing carbonate drops. Euhedral olivine, clinopyroxene, spinel and apatite crystallize in the silicate glass. We provide full major and trace element documentation of all the phases related with the premetasomatic and metasomatic history. We shall show that: a) the premetasomatic lithosphere recorded melting and basalt extraction processes, with possible evidence of MORB-melt entrapment; b) the hydrous metasomatic episode induced dramatic enrichment of the lithosphere and was responsible for virtually all the incompatible trace element budget; c) the carbonated metasomatism caused major and trace element redistribution, but altered only the U, Sr, and perhaps P and Ba, budget.