

CARBONATITE-SILICATE METASOMATISM OF MANTLE XENOLITHS FROM SANTA CRUZ PROVINCE, PATAGONIA, ARGENTINA.

1NTAFLOS, TH., 2BJERG, E.A., 3KURAT, G., 4HINTON, R.W., 2LABUDIA, C.H. AND 4UPTON, B.G.J. 1Inst.of Petrology, Vienna, Austria 2 Univ. Nacional Sur, Dept Geología, Bahía Blanca, Argentina 3Naturhistorisches Museum Wien, 4Dept of Geol. and Geophy., Univ. of Edinburgh

Upper mantle xenoliths from Gobernador Gregores, Santa Cruz, Argentina, comprise spinel-lherzolites, harzburgites, orthopyroxenites, clinopyroxenites and wehrlites. Amphibole, calcite and phlogopite-bearing xenoliths are of particular interest because they contain glassy patches of up to 1 cm in diameter. Matrix chromian diopside has a spongy envelop consisting of intergrowths of pale-green clinopyroxene (cpx) and a brownish glass, indicating a metasomatic event. Disseminated dark mica plates and pargasitic amphiboles are affected by the same metasomatic event which caused the cpx breakdown. The melt pockets consist glass with euhedral secondary, clinopyroxene, olivine, spinell, +/- calcite and sulfides. Matrix clinopyroxene is generally Ti-poor (~0.35 wt% TiO₂) and Na-rich (~3.0 wt% Na₂O), whereas the secondary clinopyroxene is Ti-rich (~1.30 wt% TiO₂) and Na-poor (~0.30 wt% Na₂O). The matrix olivine has a lower mg number (Fo₈₇) than the secondary olivine (Fo₉₁). Glasses are mostly relatively poor in SiO₂ (54 wt%). However, glasses with SiO₂ contents around 70 wt% coexist with secondary olivine in symplectites surrounding orthopyroxene. This feature suggests that reaction between metasomatic melt/fluid and orthopyroxene has resulted in incongruent melting of orthopyroxene to olivine plus silica-rich glass. Coexisting glass and pargasitic amphibole have very high Nb and Ta concentrations (470 and 220 ppm, respectively) which exclude decompressional melting of amphibole as the source of the glass. Our results indicate that the metasomatic agent was a fluid or melt with carbonatitic affinity and that under upper mantle conditions amphibole can be a significant host for Nb and Ta.