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PRELIMINARY RESULTS ON MAFIC AND ULTRAMAFIC XENOLITHS FROM CERRO CHENQUE (S. PATAGONIA, ARGENTINA).

Dominika Kozdrowska (1), Magdalena Matusiak-Małek (1), Theodoros Ntaflos (2), Jacek Puziewicz (1), and Ernesto Bjerg (3)

(1) University of Wroclaw, (2) University of Vienna, (3) Universidad Nacional Del Sur Bahia Blanca

In Patagonia, Argentina, Pliocene – Quaternary alkali basalts are related to the subduction of the Nazca and Antarctic plates beneath the South American Plate (Bjerg et al., 2005).These lavas carry ultramafic xenoliths and were erupted east of the of the active volcanic arc, occupying a backarc tectonic setting. They show typical intraplate OIB-like geochemical signatures.

Peridotitic and pyroxenitic xenoliths from Cerro Chenque (southern Argentina) are oval to angular, usually up to 5 cm in diameter and the noritic ones around 10 cm. The host rocks have the composition of trachybasalts.

The Cerro Chenque xenolith suite consists mostly of anhydrous Spl–lherzolites, Spl -dunites, -wehrlites, -websterites, -clinopyroxenites; norites occur less abundantly. Protogranular and porphyroclastic textures are dominant in peridotites, while websterites, clinopyroxenites and norites show cumulative textures. Olivine in dunites and lherzolites has chemical characteristics typical of Phanerozoic lithospheric mantle – the Fo content is in the range 90.5-92.0% while in wehrlites it reaches up to 93.0-93.5%. In the other rock types Fo in olivine varies from 0.911 to 0.927. The highest orthopyroxene mg# occurs in wehrlite (0.936) and the lowest in norite (0.714-0.767). The mg# of clinopyroxene fluctuates more significantly, varying from 0.917-0.949 in lherzolites, from 0.945 to -0.953 in wehrlites and reaching the lowest values in norites (0.721 to 0.766). The mg# and cr# in spinel are usually constant in each rock type (mg#: clinopyroxenite=0.819-0.845; wehrlite, norite, lherzolite and dunite=0.507-0.765), but in websterite the variations are striking (0.688-0.810). Opx-cpx equilibrium temperatures are unusually low and close to 720°C.

Clinopyroxenes from lherzolites display two contrasting REE patterns: U-shaped (LaN/LuN=2.024, GdN/LuN=1.951) and flat (LaN/LuN=1.101). Orthopyroxene in the studied samples is LREE-depleted (LaN/LuN=0.020-0.039).

Our preliminary results on Cerro Chenque samples show that the lithospheric mantle beneath southern Patagonia locally record strong partial melting, possibly in the Spl- stability field, further overprinted by cryptic metasomatism. The possible metasomatic agent was an anhydrous silicate melt as suggested by a Ti/Eu ratio exceeding 26000. Low clinopyroxene - orthopyroxene equilibration temperatures are quite unusual in Patagonia and deserve further studies.

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References:

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