

**UHP METAMORPHIC CONDITIONS IN GARNET-BEARING PYROXENITES
FROM LANTERMAN RANGE (NORTHERN VICTORIA LAND, ANTARCTICA):
PETROLOGY AND P-T PATH**

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Abundant lenses and pods of ultramafic and mafic rocks (KLEINSCHMIDT et al., 1987), including eclogites s.s. (RICCI et al., 1996), within a metasedimentary sequence of dominant gneisses and minor quartzites are present at the Lanterman Range (Antarctica). A common evolution characterized by three metamorphic stages have been identified for mafic and felsic rocks: (1) an eclogite stage at ≤ 850 °C and ≥ 2.6 GPa (≈ 500 Ma); (2) a medium-pressure amphibolite stage at 630 - 750 °C and 0.7 - 1.0 GPa (498 Ma); (3) a low-pressure amphibolite stage at 500 - 650 °C and 0.3 - 0.5 GPa (490 - 486 Ma) (PALMERI et al., 2003 and references therein).

Ultramafic boudins mainly consist of serpentized peridotite and minor amphibole-rich fels. Rare garnet-bearing pyroxenites are also present. They are composed of orthopyroxene, garnet, olivine, clinopyroxene, amphibole with accessory spinel, rutile and secondary chlorite, serpentine and talc. Detailed petrographical analyses allow to reconstruct the igneous protolith and five metamorphic stages. The protolithic minerals are represented by Opx_0 , $\pm Cpx_0$ and $Spl_0 \pm Cam_0$, found as tiny inclusions in poikiloclastic Gr_t . Metamorphic stage I consists of the ultrahigh pressure assemblage $Gr_t + Opx_1 + Ol_1 + Cpx_1$ forming centimetric medium-grained levels. Stage II is characterized by millimetric fine-grained levels of idioblastic Gr_{II} , Cpx_{II} , $Opx_{II} \pm Cam_{II}$ and Ol_{II} . Stage III is defined by kelyphytic coronas around Gr_t with an inner zone of $Opx_{IIIa} + Cpx_{III} + Spl_1 \pm Cam_{IIIa}$, and an outer zone, in contact with Ol_1 , of $Opx_{IIIb} \pm Cam_{IIIb}$. Cam_{IV} poikiloblasts enclosing resorbed Gr_t , Cpx , Opx and Ol of both stage I and II, characterize stage IV. Stage V is a typical greenschist facies association with $Tr + Mg-Chl + Srp \pm Tlc$. The mineral inclusions in porphyroclastic Gr_t indicate that the protolith formed in the spinel lherzolite P-T field ($T \approx 700 - 1400$ °C, $P \approx 0.3 - 2.4$ GPa). During the cambro-ordovician Ross orogeny, pyroxenites were tectonically amalgamated with supracrustal units, including felsic and MORB-like basalts, together with experienced UHP metamorphism. P-T estimates indicate that the UHP metamorphism (stage I) occurred at 750 - 850 °C and 2.6 - 3.4 GPa which are similar to P-T conditions estimated in mafic and felsic rocks. The exhumation history, as documented by stage II to V, followed an early near-isothermal path and a later cooling-unloading evolution.

References

- KLEINSCHMIDT, G., SCHUBERT, W., OLESCH, M. & RETTMANN E. (1987): *Geol. Jahrb.*, 66, 231-273.
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