



The origin of the non-serpentinic phases of the Gogołów-Jordanów serpentinite massif (SW Poland)

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The Gogołów-Jordanów serpentinite massif (SW Poland) is a member of pseudostratigraphic sequence of the Variscan Śląża Ophiolite. The outcrop of serpentinites is 22 km long and up to 7 km wide. The serpentinites occurring in the central and western parts of the Massif (Radunia Massif and Kiełczyńskie Hills) contain grains and aggregates of olivine, clinopyroxene and Cr-spinel. Pseudomorph and non-pseudomorph serpentinites, containing channelling structures occur in all parts of the massif. West part of massif contacts with later Strzegom-Sobótka granitic massif (age of 325 and 280 Ma).

Olivine forms 3 types of grains: olivine I (Fo₈₂, 0.2 – 0.4 wt. % NiO), olivine II (Fo_{89.5-93.1}, NiO = 0.2 – 0.4 wt. %) and olivine III (Fo_{94.1-95.2}, NiO = 0.35 – 0.50 wt. %). Clinopyroxene occurs in 2 varieties: clinopyroxene I (mg# = 0.95-0.97; up to 0.6 wt. % Cr₂O₃ and up to 1.1 wt. % Al₂O₃) and clinopyroxene II (mg# = 0.92-0.95; Cr₂O₃ 0.8 – 1.4 wt. %; Al₂O₃ 2.2 – 4.1 wt. %). They are depleted in Gd, Tb, Dy and Ho and slightly enriched in Er, Tm, Yb, Lu relative to chondrite. Clinopyroxene II and olivine II occur as singular grains or as irregular elongated aggregates. Clinopyroxene I and olivine I form "cleaved" intergrowths. Olivine III occurs as "cleaved" single grains nearby granite intrusion. The whole rock composition of serpentinites show variable contents of CaO (0.03 - 1.65 wt.%).

The form of occurrence of olivine II and clinopyroxene II suggest that the minerals could be the remnants of channels used by percolating melt. Their chemical composition is identical to those occurring in the MOR regions which originated due to melt basaltic percolation in the upper mantle peridotites. Preservation of those structures was possible due to (1) less intense serpentinization in the area or (2) rejuvenation due to subsequent metamorphic events. Olivine III is probably the pseudomorph after bastite structure due to its deserpentinization. Clinopyroxene I and olivine I originated probably because of thermal effect of granitic intrusion.