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Preliminary data on chromitite from Czernica Hill, Ślęża Ophiolite (SW Poland)

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The Gogołów-Jordanów serpentinite massif (SW Poland) is a member of pseudostratigraphic sequence of the Variscan Ślęża Ophiolite. The outcrop of serpentinites is 22 km long and up 7 km wide. The serpentinites occurring in the central part of the Massif (Czernica Hill) contain grains and aggregates of Cr-spinel. Chromite accumulations occur as pockets, veins or dispersed grains within serpentine-chlorite mass. The chromitite host rock is usually completely serpentinized, but in places chromitite veinlets are surrounded by olivine. Such olivine grains are zoned - their edges are enriched in fayalite.

Chemical composition defines two groups of chromite: chromite I (Cr# = 0.49 - 0.58) containing 23.32 - 28.36 wt.% Al_2O_3, 40.29 - 48.10 wt.% Cr_2O_3, 15.10 - 15.50 wt.% FeO, 14.50 - 15.50 wt.% MgO and 0.10 - 0.25 wt.% Na_2O and chromite II (Cr# = 0.71 - 0.73) containing 13.83 - 15.24 wt.% Al_2O_3, 54.85 - 56.65 wt.% Cr_2O_3, 16.71 - 18.04 wt.% FeO, 10.62 - 11.59 wt.% MgO and 0.45 - 0.52 wt.% Na_2O. The TiO_2 content ranges between 0.10 and 0.15 wt.%, PGE and REE were not detected by the LA ICP-MS method. Chromite grains consist mostly of chromite I, whereas the chromite II forms irregular domains up to 150 μm, located mainly at grain edges and fissures.

The low TiO_2 content and intermediate Cr number are typical of chromites formed in mid ocean ridge setting, which originated due to reaction of peridotite and MOR basalt. The Gogołów-Jordanów chromitites are probably remnants after melt-rock interaction within Moho Transition Zone (MTZ) and mark the places of focused melt flow (Leblanc and Ceuleneer, 1992). In this context, chromium and aluminium come probably from peridotitic pyroxenes that react with basaltic melt. Chromites crystallized within small magma chambers as cumulates, when magma migration was blocked.

Chemical composition of chromite II (depletion in Al and Mg and enrichment in Cr and Fe relative to chromite I) suggest that this is altered phase after chromite I. Such alteration is typical for chromites that underwent greenschist facies metamorphism (Gonzalez-Jimenez, 2009).

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