

**EXPERIMENTAL CORONA TEXTURES MODELLING: DIFFERENCES IN CORONA-FORMING REACTIONS IN OLIVINE-PLAGIOCLASE AND ORTHOPYROXENE-PLAGIOCLASE INTERFACES DURING ECLOGITISATION OF GABBROS**

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Corona textures usually develop between primary magmatic Fe-Mg minerals and plagioclase during prograde metamorphism (eclogitisation) of gabbros. Different types of the corona textures in Belomorian belt (Baltic shield) and in Marun-Keu (Polar Urals) display major differences of olivine-bearing and olivine-free coronites (formed at the same P-T conditions): “clouding” of plagioclase with spinel grains was found only in olivine-bearing coronites; garnet layer upon primary orthopyroxene was **never** found in Ol-bearing coronites (unlike Ol-free ones, where garnet corona is common). New experiment was made to study the compositional differences in corona sequences in Ol-Pl and Opx-Pl interfaces. Like our previous experiments (LARIKOVA & ZARAIISKY, 2002, 2004), in which seven zones  $En + Gedr2 / Trem / Gedr1 + Fo / Chl / Parg / Cpx / Grt + An$  were received between primary Opx and Pl, the new run has been carried out in hydrothermal exclave of IEM RAS at  $T = 700\text{ }^{\circ}\text{C}$  and  $P = 5\text{ kbar}$  during three weeks. In a gold capsule fine-grained powder of plagioclase was interleaved with enstatite and olivine layers; crystals of Pl and Ol were placed inside the Pl layer. Well-defined corona textures were formed at all contacts; each corona has two distinct layers with sharp boundaries (100  $\mu\text{m}$  in width):

***Ol – (En + Gedr) – (Phlg1 + Ca Hbl) – Pl; En – (Phlg2 + Al En) – Ca Hbl – Pl.***

An inner layer in the corona around olivine consists of orthopyroxene and amphibole (gedrite), an outer - Al-rich phlogopite1 with some hornblende grains. In the corona after enstatite an inner layer consists of phlogopite2 with some newly formed Al-rich orthopyroxene, and an outer amphibole layer. Primary plagioclase ( $An_{62}$ ) became more sodic ( $An_{52}$ ) at the contact with the corona around olivine; in contrast to one in the corona after orthopyroxene that has higher Ca content (up to  $An_{71}$ ). The compositions of the experimental coronas show the opposing gradual diffusion of Ca and Al from plagioclase and Mg from enstatite and olivine; and more aluminium-rich corona minerals were formed around olivine, and after orthopyroxene – Ca-rich minerals. According to the model of simultaneous coronas growth by mechanism of diffusion metasomatism, differences in layer sequence of the coronas are supposed to depend on the diverse chemical potential gradients of the diffusing components in the Ol-Pl and Opx-Pl interfaces in the fluid phase. Thus the experiment corroborates natural observations on the major differences in both compositions and sets of minerals, and mainly in the trends of the plagioclase composition changes, in coronas around olivine and orthopyroxene at their contacts with plagioclase.

The study was financially supported by RFBR, project N 03-05-64487.

#### References

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