ILMENITE PSEUDOMORPHS AFTER TITANITE FROM THE GRANITE ROCKS IN THE TRIBEČ MOUNTAINS (WESTERN CARPATHIANS)

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A new type of the titanite alteration, not described up to now, has been observed in the granitoids of the Tribeč Mts., which belong to one of the core mountains of the Western Carpathian region. Euhedral wedge shaped titanites in these granites were substituted by ilmenite whereas their characteristic shapes were preserved and these grains became black. The newly formed ilmenite in the high level alteration products contain not less then 95% of the ilmenite modal composition of the former titanite. Such strong mineral exchange were observed only in the highly deformed (mylonitized) granitoids with sericite-epidote and chlorite matrix after rock forming minerals. However, the initial stage of the titanite breakdown process is a very widespread phenomenon in the granites of the south-west part of the Tribeč Mountains. The titanite host rocks represent mainly the granodiorite–tonalites which belong to the granites with I-type tendencies (PETRIK & KOHUT, 1997). The Upper Carboniferous age of these granitoides is known from U/Pb dating of zircons (306 ± 10 Ma, BROSKA *et al.*, 1990).

Titanite breakdown products in the initial stage of alteration are firstly concentrated near rims inside titanite, then replacement continues irregularly in other parts within titanites. The final stage is represented by the replacement of the whole titanite grain by the newly formed ilmenite mineral phase. The ilmenite is rich in manganese that indicates its relatively low temperature origin (LYACHOVITCH, 1973). Except for ilmenite, mainly quartz but also epidote and allanite appear as further alteration products. The formation of numerous pores accompanies this breakdown process and the titanite obtains a more or less porous structure. The allanite and REE epidote inclusions in titanite originated by leaching of REE's from titanite (PAN *et al.*, 1993). In comparison with primary allanite (approx. 10 wt % Al_2O_3 and 6 wt % total FeO), the secondary one is richer in aluminum and iron (approx. 20 wt% Al_2O_3 and 10 wt % total FeO).

It is highly probable that the origin of secondary ilmenite and other mineral phases inside titanite would be the process which is connected with subsolidus alteration of rock that indicates the chemistry of alteration products and the porosity of the altered titanite.

References

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