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WHITE MICA FROM THE BRNJICA GRANITOIDS (EASTERN SERBIA)

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Granitoids of East Serbia, associated with the Carpathian-Balkan arc, form a NNW-SSE elongated zone of about 200 km in length. It starts from the river Danube to the north and extends up to the southern slopes of Mt. Stara Planina, at the Yugoslavian-Bulgarian border. These granitoids were studied by numerous researchers from the end of 19th century till 1970, but many features related to mineralogy (i.e. mineral chemistry) are still unsolved. The magmatic activity in the above mentioned area was very intensive during Carboniferous and Permian time (259 to 342 Ma). In this paper we present new mineralogical data and chemistry of white mica and an attempt is made to investigate its origin in the Brnjica Granitoids (BG), located in the Danube Gorge. The BG (272-259 Ma - Rb/Sr) occurs in the Kucaj terrane (KARAMATA & KRSTIĆ, 1996), the oldest rocks of which are the Proterozoic metamorphic rocks, followed by the late Proterozoic to early Cambrian "Green Complex" During the Variscan magmatism the BG intruded the above rock formations as a late- to post-kinematic intrusion, causing extensive thermal metamorphic phenomena. The BG is a composite pluton consisting of (±Hb)-Bi tonalite (TON), (±Ms)-Bi granodiorite (GRD), two-mica granite (TMG), and leucogranite (LG). Fe-biotite is the main ferromagnesian constituent in all rock-types except LG. Mg-hornblende is present, in small quantities, only in TON. Plagioclase is of oligoclase-andesine composition. Late and/or subsolidus muscovite is present in small quantities in GRD, although some grains have features of primary muscovite, and also as the main phase in TMG and LG.
White mica (1-10 vol%) occurs as primary idiomorphic or secondary flakes commonly 0.15 to 0.6 mm long, rarely up to 1.25 mm, emplaced between feldspar or intergrown with biotite in TMG, GRD and LG. The interlayering of muscovite and biotite is used as textural evidence for its primary origin. Sometimes it makes fine-grained elongated segregations. According to their chemical composition some grains in GDR are TiO_2-rich (1.96-3.27 wt%). Ti concentrations are relatively high for this mineral (~ 0.06-0.12 apfu), while Mn does not exceed 0.02 of an atom in octahedral site. The interlayer site is mainly filled with K (1.7 apfu on average) with lower amounts of Na (0.1 atoms), resulting in relatively low paragonite component (~6 % on average). The examined white micas have phengitic composition in GDR slightly approaching the muscovite end-member from TMG to LG. The phengitic component expressed as the percentage of the $(Fe^{2+}+Mg+Ti+Mn)/(Fe^{2+}+Mg+Ti+Mn+Al)$ ratio, ranges from 4 to 18 %. The chemistry of muscovite is characterized by variable levels of substitution of octahedral Al by Mg, Fe and Ti. X_{Mg} ranges from 0.32 to 0.62. The mean composition of muscovite suggests that biotites with high Al content coexist with muscovite close to the ideal composition (VASKOVIC et al., 2004).

References

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