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WEATHERED FELDSPAR, MUSCOVITE AND TOURMALINE FROM PEGMATITES OF THE SOMEŞ SERIES (APUSENI MOUNTAINS, ROMANIA)

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The present paper deals with a short description of some weathering features we have put in evidence on pegmatites hosted by medium-grade metamorphic rocks of the Someş series (mica schists, gneisses, migmatites etc.). The pegmatite bodies occur as veins and lenses; their mineralogy is simple: quartz, feldspars, muscovite as principal minerals, while biotite, garnets and tourmaline as subordinate minerals. The composition of pegmatites is a granite-like one; genetically they are products of both metamorphic differentiation and anatectic processes (MÂRZA, 1980; STUMBEA, 1999).

Analytical techniques we have used are wet chemical analysis, electron probe microanalysis (CAMECA SX 50), XRD analysis (PHILIPS PW 1730) and scanning electron microscopy – SEM (JEOL 100).

The physical and chemical behaviour of feldspars, muscovite and tourmaline was followed in vertical and horizontal profiles; the presence of tectonic phenomena have also been considered.

Physically, loss of smoothness, appearance of cracks (particularly following the cleavage directions) and even of powder (tourmaline especially) in the mineral mass have been recorded. The relationship between the width of cracks and the depth at which the sample was taken is revealed by a negative correlation we noticed for this pair of parameters. On the contrary, in terms of feldspars a positive correlation between the abrasion hardness and depth was recorded. Horizontally, these relationships have not been found at all or they are much less evident. In the last case they seem to be connected with local tectonic phenomena, the same ones that made possible the formation of the vein-like pegmatite bodies.

In terms of chemical composition, loss of SiO_2 in both potassium feldspar and plagioclase, partial removal of Na_2O and CaO in plagioclase and a relatively constant amount of Al_2O_3 in all feldspars have been noticed. The geochemical balance concerning muscovites shows reduced changes during the weathering process: more or less marked oxydation of Fe(II) with the appearance of Fe(III); loss (sometimes pronounced) of MgO; variable removal of K_2O and Na_2O. Moreover, XRD analyses show a reduced presence of secondary minerals (1.80–8.00% montmorillonite + chlorite) in muscovite samples. Tourmaline is generally quite resistant at the earth's surface in terms of chemical composition; the most pronounced change we have noticed is the oxydation of Fe(II).

References

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