

PETROLOGICAL AND GEOCHEMICAL ARGUMENTS FOR THE NATURE AND SOURCE OF THE SZARVASKÓ COMPLEX (NE-HUNGARY)

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The Szarvaskó complex exposes a fragment of Jurassic mafic and ultramafic igneous rocks (DOWNES et al., 1990). They have been described as a dismembered portion of a Mesozoic ophiolitic sequence formed in a narrow basin of the Vardar Ocean (AIGNER-TORRES & KOLLER, 1999). The magmatic sequence consists mainly of extrusive basaltic pillow lavas together with gabbroic sills intruding into terrigenous shales, and minor ultramafic and plagiogranite rocks (BALLA et al., 1983, AIGNER-TORRES & KOLLER, 1999). The basalts and some of the gabbros show fractionated N-MORB-like patterns with a low Nd, indicating a possible enriched source component. Some of the gabbros and the unusual ultramafic rocks, described originally as wehrlites, have rather low REE pattern and are regarded as cumulates (AIGNER-TORRES & KOLLER, 1999).

These wehrlites contain according to AIGNER-TORRES (1996) dominant olivine (Fo_{0.51-0.49}) and rare orthopyroxene (Fs_{0.38}), higher amounts of a variable clinopyroxene (XMg 0.82-0.58) and minor brown amphiboles with a wide compositional range from tschermakite to magnesiohornblende. Besides minor An-rich plagioclase high amounts of ilmenite and titanium magnetite up to more than 20 vol% are the main features of this rock type. The wehrlite samples can be classified as hornblende peridotites or as olivine-ilmenite cumulate. In any case these samples represent a member of a classical tholeiitic fractionation trend with high Fe- and Ti-enrichment. The low Cr- and high V-contents in contrast can be only explained by a fractionation from an evolved basic melt indication also rather high oxidation state.

On the other hand the plagiogranites show an inverse pattern with overall high trace element contents and remarkable negative Eu anomalies. This sample suite with clear

magmatic mineral assemblages cannot be related solely by fractionation of a common MORB source only. They represent a combination of a MORB-like fractionation of olivine+plagioclase+clinopyroxene±chromite and a minor, but still important influence of assimilated terrigenous sediments abundantly present in the area. The most interesting minerals in the plagiogranites are strongly zoned almandine rich garnets and an Fe-rich epidote with high amounts of REE, both are of magmatic origin.

The presence of the rare ultramafic cumulates and the plagiogranites beside the common pillow lavas and various gabbros with N-type MORB composition are still the best arguments for an ophiolitic nature of the Szarvaskó complex. Although, based on the geochemistry data, there is no subduction-related component, AIGNER-TORRES & KOLLER (1999) suggest a back-arc basin affinity for this complex. The secondary mineral assemblages with prehnite and pumpellyite are either part of the oceanic metamorphism or more possibly related to the Alpine overprint and define clearly the post-magmatic history and the limits of the emplacement mechanism for the Szarvaskó complex.

References

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