metatexitic paragneiss with Phl + Gt(Bt) + Ky(minorSill) + Pl + Qtz + Kfs + Rt + Gr. Melting should have been anhydrous; likely dehydration melting reactions are:

a) Bt + Pl + Qtz = Cpx + Gt ±Kfs + melt.

b) Phe + Pl + Qtz = Phl + Als + Gt + melt

c) Bt + Als + Qtz + Pl = Gt ± Kfs + melt.

The leucosomes are anhydrous pegmatites or aplites, bearing mostly Di-Hd cpx (when hosted in marbles) or garnet (when hosted in biotite gneisses). Graphite and sulphides are ubiquitous in both mesosomes and leucosomes, suggesting highly reduced conditions during melting.

Correlation of Neotethyan rifting related peperitic basaltic occurrences in the Dinarides, displaced fragments of the Dinarides and in the Hellenides

Kiss G.[1], Molnár F.[1], Palinkaš L.A.[2] and Kovács S.[3]

[1]*Department of Mineralogy, Faculty of Science, Eötvös Loránd University, 1117 Budapest, Pázmány P. sétány 1/c, Hungary, gabriella-kiss@chello.hu*

[2]*University of Zagreb, Faculty of Science, Institute of Mineralogy and Petrology, 10000, Zagreb, Horvatovac bb., Croatia*

[3]*Research Group of Geology, Geophysics and Space Sciences, MTA-ELTE, 1117 Budapest, Pázmány P. sétány 1/c, Hungary*

Volcanological, mineralogical, petrological and geochemical studies on pillow lavas, peperites and hyaloclastite breccias as parts of basaltic extrusions of Triassic age into uconsolidated deep water sediments were carried out in the Jurassic mélange of the Darnó Unit (NE Hungary), which is a displaced fragment of the Dinarides. The results were compared with similar occurrences in the Kalnik Mts. (Croatia) and Vareš-Smreka (Bosnia and Herzegovina) in the Dinarides and in the Stragopetra Mts. (Greece) in the Hellenides. Earlier sedimentological and lithostratigraphical studies suggested advanced rifting-related origin to these formations; however petrological and petrochemical comparisons are made in the framework of the present study.

At the studied localities at most six different volcanological facies can be distinguished (coherent pillow, closely packed pillow, in-situ hyaloclastite breccia, pillow fragmented hyaloclastite breccia, isolated pillow breccia and peperitic basalt); in the Kalnik Mts., a complete submarine lava mould-flow complex with all of these facies is known. Comparing the other localities to this complete system, the volcanological facies can be identified even in occurrences characterized with small blocks. In the studied Darnó Hill quarries, the closely packed pillow, the hyaloclastite breccia and the peperitic facies were observed, suggesting an originally distal position in the submarine lava flow. At Vareš-Smreka and Stragopetra only the peperitic facies is known. This facies bears high importance, as it forms when the lava arrives into the water soaked sediment; mingling the basalt with the limey mud is a clear evidence of early rift-type formation (i.e. formation above the CCD level), and this can be used in the field to distinguish these associations from the Jurassic ophiolites (formed below the CCD level) occurring in the same mélange.

Petrographic features show similarities among the basalts of the studied localities; the textures are sphaerolitic and variolitic, while the main rock forming components are albitized plagioclase with skeletal crystal habit, calcite/chlorite/serpentine pseudomorphs after olivine, opaque minerals (pyrite, chalcopyrite, hematite) and microcrystalline material as groundmass while clinopyroxene and glass are rare.

Results of the fluid inclusion studies and examination of the hydrothermal minerals at all the studied localities show that extended fluid circulation system did not develop, but rapid cooling was characteristic in the seawater-dominated hydrothermal system. Several stages of the alteration can be distinguished; after the chloritization of the groundmass, the hydrothermal infillings (quartz, chlorite, epidote, prehnite, pumpellyite, calcite and zeolite) of the amygdales, veins, pyjamas-type basalts' mineral bands and earlier feeding channels of lava lobes have formed, then finally the low-temperature layer-silicates precipitated. Fluid inclusion and chlorite thermometry data suggest shallow depths of 1.4-4 km for the fluid/rock

interaction processes. Hence the advanced rifting-related origin is also more supported than the mid-oceanic ridge-related setting.

Petrochemical features of the studied rocks show mainly within-plate basalt characteristics, while the MORB-features are subordinate. The studied Triassic basalts are forming a group easily distinguishable from the Jurassic basalts of the same mélange on the different discrimination diagrams. The high Zr/Y ratios (above 4) are also characteristic to the within plate basaltic volcanics. Thus the geochemical data also support that the Triassic pillow basalts, containing pelagic carbonate peperitic facies, are related to the advanced stage rifting of the Dinaridic-Hellenidic Neothethys. However the good correlation among the different studied occurrences and their genetic relationship are also shown with the help of the REE pattern which show slight enrichment from La to Gd in comparison to the Jurassic ophiolites.

Petrochemical signatures of Sarmatian volcanic rocks in the mineralized and unmineralized areas of the Tokaj Mountains, NE-Hungary

Kiss P.[1], Molnár F.[1], Gméling K.[2] and Pécskay Z.[3]

[1]*Department of Mineralogy ELTE, Budapest, Hungary, geokissp@gmail.com*
[2]*Institute of Isotopes, Hungarian Academy of Sciences, Budapest, Hungary*
[3]*Institute of Nuclear Research of the Hungarian Academy of Sciences, Debrecen, Hungary*

The Tokaj Mts. is located in northeastern Hungary and is a part of the Inner Carpathian Volcanic Arc. This Arc was formed from the Lower-Middle Miocene to almost recent times. In the Tokaj Mts., medium to high K intermediate and acidic calc-alkaline volcanic rocks have been accumulated during the Middle-Upper Miocene (Badenian-Sarmatian-Pannonian) in an N-S oriented volcanotectonic graben that is underlain by Proterozoic to Mesozoic crystalline rocks.

Although a huge number of K/Ar age data is available for the igneous rocks and hydrothermal processes in the Tokaj Mts. no modern systematic geochemical database has existed up to now. In this study, we used rhyolite, dacite and andesite samples of Sarmatian age selected from the K-Ar database and new samples from outcrops were also investigated. The samples were selected on the basis of their K-content and their relationships to hydrothermal mineralization. In the southern part of the mountains, high K rhyolites are laden with shallow levels of low sulphidation type epithermal systems. Opposite to this, rhyolite field with lower K-content in the northern part of the Tokaj Mts. have no hydrothermal mineralization.

There are differences not only in major, but also in trace element geochemistry between the samples from the northern and the southern part of the Tokaj Mountains. Previous papers determined that the southern rhyolites contain K-feldspar phenocrysts in accordance with the significant potassium enrichment (whole rock K2O content varies in between 4.35–5.61 wt%) while rock forming K-feldspar is absent in the rhyolites from the North (where their K2O content is 3.28–5.1 wt%). Dacites also show some differences and they were formed in the same time as rhyolites and andesites (in between 11–13.4 Ma) in the northern Tokaj Mts., while they are much younger (10.1–10.57 Ma) than those rocks in the southern Tokaj Mts. Both the boron content (10.1–68.1 µg/g) and the spider patterns of other trace elements in the volcanic rocks show typical subduction related features, however the direct influx of the subduction related fluids during magma generation can be excluded. Rather possible explanation for the magma genesis is decompression melting of a previously metasomatised mantle, enriched with subduction related components. The presence/absence of rhyolite-connected epithermal systems appears to be correlated with the Cl content of the rocks: samples from the unmineralized northern rhyolite field contain much less Cl (below 0.2 wt%) than high-K rhyolites in the southern part of the Tokaj Mts. (more than 0.2 wt%)

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