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GEOCHEMISTRY OF THE METATRACHYTES FROM THE KONRADÓW (SUDETES) – PRELIMINARY DATA

INTRODUCTION

Outcrops of acidic metavolcanics are common in the Stronie Unit representing fragment of the Orlica – Śnieżnik Dome situated in the NE part of Bohemian Massif. Most of them form intercalations of leptites or leptinites within gneisses, but some of these occur as a tectonic enclosures within micaceous schists.

Aim of this study is presentation of preliminary geochemistry data concerning of trachyte-like metavolcanics outcropped near Konradów at the vicinity of Lądek Zdrój.

GEOLOGICAL SETTING

The studied outcrop of metatrachytes is situated in the central part of Śnieżnik Metamorphic Unit. In this area the grey, albite, biotite-bearing, albite-plagioclase or biotite-muscovite paragneisses occur with transitions into micaceous schists. They contain many different enclosures such rocks as: quartzites, graphite schists, calcite-dolomite marbles, amphibolites and amphibolitic schists. In the other cases, the thin intercalations of leptites or leptinites (quartz-microcline-plagioclase schists) also occur. From structural point of view this suite is known as Stronie Unit (Stronie Complex sensu: Fischer 1936).

The finds of microfossils in the quartzites from Goszów, as well as in the calcite marbles fromvicinity of Nowy Waliszów and Romanów villages allowed to determine age of primary sedimentary sequence on Late-Proterozoic-Early Cambrian time span (Gunia 1989).

Samples for geochemical determinations were taken from the single crag localized on eastern slope of Wapnisko hill near Konradów. In this point the ditrection of penetrative foliation plane is approximately NW-SE with dipping on NE at the angles of 45-60 degrees. This foliation is often disturbed by several generations of latter folds F_1-F_4 showing different deformation events. The linear structures are represented there by presence of intersectional lineation l_2 and mineral lineation l_3.

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The geological position of Wapnisko metatrachytes was diversively interpreted. Previously they were regarded as: quartzites (Don 1964), blastomylonitic microcline-bearing paragneisess (Butkiewicz 1972) or primary acidic lavas, tuffs and tuffites (Wojciechowska 1972, Cwojdziński 1983). On the present state of knowledge their age and geotectonic position is still unknown.

PETROGRAPHY AND APPLIED METHODS

The detailed descriptions of Wapnisko metatrachytes have been reported in the many previous articles (Butkiewicz 1972; Don 1964, 1982; Smulikowski 1979 and Cwojdziński 1983). In this work, the sample used for geochemistry was pinky in colour, fine-grained with subtile lamination (locally folded) marked by presence of parallely oriented sets of mica platelets. Under microscope the porphyroclastic structure and unoriented texture was common, whilst the main rock-forming components are quartz, acidic plagioclase, microcline, muscovite and locally biotite. The chlorite, epidote, garnet, turmaline, apatite, zircon and opaque Fe-oxides occur there sporadically. The most of larger porphyroclasts are table-shaped or sharp-edged K-feldspars (microclines), which are often surrounded by fine-grained mosaic composed of tightly intergroved xenomophic crystals of quartz and plagioclase.

One sample of Wapnisko "metatrachyte" has been selected for geochemical studies. The bulk-rock chemistry and determinations of trace and rare-earth elements abundances were performed in Canadian Laboratory Ltd. using XRF, INAA and ICP-MS techniques with valuable assistance of GeoAnaliza Enterprise from Cracow.

GEOCHEMISTRY

The studied sample of greyish-pinky metavulcanite „porphyroids" exhibits trachyte composition (SiO_2=63,8% wt., #Mg= 14). Both on TAS and Zr/TiO2 – Nb-Y diagrams (Winchester & Floyd 1977) projection point occupies the trachyte field. Geochemistry displays feature typical of silicic peralkaline rocks (pantellerites), which are enriched in Na_2O K_2O, FeO*, Zr and Nb, and depleted in Al_2O_3, Sr and Ba relative to silicic metaluminous rocks, whilst the Zr/Y ratio can be indicative for the within-plate setting.

The contents of trace elements plotted on MORB - normalized multielement diagram show distribution profile typical for trachytes. It is characterised by the presence of strong K, Rb, Ba, Th, Hf, Nb, Ce enrichment and strong Ti depletion. It can reflect crustal contamination of trachytic lava and suggests a very complicated, probably multi-stage conditions of melt formation.

On chondrite-normalized REE spider-diagram of Wapnisko metavolcanite shows the strong enrichment of LREE (100-300 time chondrite) and clear negative Eu anomaly. The flat position of profile line in the MREE and HREE range (60-70 time chondrite) suggests important role of fractional crystallization during forming

of pristine melt (Pearce 1983). During last equilibration event the extraction of phases accumulating Eu from primary felsic melt took place. Interestingly, the contents of trace and REE elements in the Wapnisko metatrachyte sample is similar to the Lubrza trachites (Kaczawskie Mts), which are interpreted as a fragment of rift-related bimodal alkalic suite originated during contemporanous eruption and sedimentation events (Muszyński 1994).

CONCLUDING REMARKS

The obtained results may indicate, that the studied rock was formed from trachytic magmas originated in the shallow level magma reservoir as a result of fractional crystallisation of primary magma. Pimary melts generation could be predicted to the within-plate eniviroment.

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