Fig. 2. Seismic signal of a tectonic microearthquake near Kralický Sně•ník (October 16th 2001, 05:04 UTC, ML = 1.0) registered at ANAC station (see Fig. 1).

re. For the time being it can be simply stated that some seismic events correlate well with the continuance of NW-SE trending sudetic faults. Concerning the interpretation of the events in cluster 3 we can utilize a reflection seismic profile 5/83 running in NNW-SSE direction 5 km to the east of the epicentres. In this profile, a 3 km long, sub-horizontal reflections occur in the proximity of the hypocentres at the two-way times of 3.9–4.0 s, which corresponds to the depths of 11–12 km. This high-amplitude reflection zone can be explained with the existence of significant shear zone within the crystalline complex, whose roof is interpreted to be in the depth of 5 km.

Cluster 4

Another group of epicentres occurs approximately 10 km SE of Šternberk, in the area where several seismic events have been already registered before this local seismic network was installed (Skácelová et al., 1998). The depth of foci ranges between 4 and 7 km. As far as the assignment of this seismically active area to its tectonic source is concerned three significant structures should be mentioned. The Šternberk-Horní Benešov zone, representing a major tectonic structure which is manifested both by an array of the outcrops of Devonian volcanic and pre-flysch sedimentary rocks and by distinct and abrupt step in a gravimetric map. Linsser indications document associated density contrast at least down to the depth of 8 km. Another structure which is well defined in the map of Linsser indications can be seen between the towns of Horní Město and Moravský Beroun, striking NW-SE. Third prominent structure of the area figures as a remarkable line in gravimetric and relief maps, running in a NNW-SSE direction between Rý•oviště and Karlova Studánka and hosting a part of Moravice river watercourse.

Cluster 5

Epicentres of two events lying SSW from Staré Město roughly correspond with the western boundary of the Staré Město Belt (Lugian domain). The dense rocks of this tectonic unit (amphibolites, serpentinites) are manifested by positive gravity anomalies. Linsser indications document sub-vertical direction of the density contrast boundary down to a depth of 2 km. Near the eastern boundary of the Staré Město Belt another event was registered with focus at a depth of 10 km. Linsser indications document steep SE dipping density contrast boundary down to 2 km at the eastern margin of the Lugian domain.

Cluster 6

The westernmost group of seismic events registered so far is situated approximately 7–8 km southwards from the peak of Kralický Sně•ník mountain. The depth of foci is 10–12 km and the epicentres lie within the negative gravity anomaly that is possibly connected with large volume of relatively light orthogneisses and metagranites of Orlice-Snieznik Complex. Skácelová et al. (1998) assumes that the recent tectonic activity in the area of Kralický Sně•ník can be explained by Kletna fault movement.

Currently, the installation of seismological station is being accomplished in a tunnel beneath the lower reservoir of the Dlouhé Stráně Pumped-Storage Power Plant. This station will play a decisive role in the study of reservoir-induced seismicity.

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Preliminary Data on P-T Metamorphic Conditions in the Metapelites from the Bystrzyckie Mts. (Orlica-Śnieżnik Dome, W Sudetes)

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Introduction

The Orlica-Śnieżnik dome is situated in the easternmost part of the West Sudetes. The western limb of the dome comprises a large orthogneiss body (Śnieżnik orthogneiss) enveloped by rocks of the Stronie formation mainly including mica schists, paragneisses, basic and acid metavolcanics and marbles. Metapelites from the eastern part of the Orlica-Śnieżnik dome are metamorphosed under the P-T range of the amphibolite facies (Józefiak 1998; Szczepański and Anczkiewicz, 2000; Białek, 2001; Romanová and Štípská, 2001). Nevertheless, there is no P-T data for the rocks from the western part of the dome. The aim of this study is to provide preliminary geothermobarometric data on metamorphic conditions in the metapelites from the Bystrzyckie Mts.

Methods

Two samples of metapelites (S5, S16) were investigated by means of the electron microprobe CAMECA-CAMEBAX in the laboratory of the Warsaw University. Samples were collected in the vicinity of Wójtowice in the Bystrzyckie Mts. Calculations were performed using the program THERMOCALC of Powell and Holland (1994). Additionally, temperatures of metamorphism were estimated using the garnet-biotite (Ferry and Spear, 1978; Hodges and Spear, 1982, Ganguly and Saxena, 1984) and garnet-muscovite (Green and Helmann, 1982) geothermometers.

Petrography and mineral composition

Investigated rocks are mainly composed of quartz, plagioclase, micas (both muscovite and biotite) and garnet with apatite, zircon, turmaline, chlorite, rutile and opaque minerals as accessories. Muscovites contain significant and variegated amount of Si^{4+} (6.75–6.16 a. p.f.u.). Analysed plates are characterised by low Ti^{4+} content (0.05–0.01 a.p.f.u.) and wide variety of Na^{+} content (0.4–0.11 a.p.f.u.). Biotites display Si^{4+} content in the range of 5.61–5.27 a.p.f.u. The XFe[=Fe/(Fe+Mg)] ranges between 0.64 and 0.45 and Ti^{4+} concentration varies from 0.19 to 0.13 a.p.f.u. Garnet is almandine with normal growth zoning pattern implying its growth during progression of metamorphism. The cores and rims compositions are Alm57-63Py4-5Spe13-21Gr13--23 and Alm63-75Py5-7Spe17-13Gr6-23, respectively. Analysed plagioclase grains display albite composition (An0-2).

P-T conditions

Temperatures calculated using garnet-biotite and garnet-muscovite geothermometers differ by about 40 °C and yielded values of 424 ±46 °C and 463 ±63 °C, respectively. Further P-T estimations were performed using the Thermocalc program. The sample S5 recorded P=7.4±1.7 kbars and T=381±62 °C for the final equilibration conditions corresponding to the mineral assemblage: quartz + muscovite + biotite + garnet. A similar result was obtained for the sample S16. Peak metamorphic conditions recorded by the same paragenesis yielded P = 8.0 ±1.9 kbars and T = 438 ±70 °C. Presented results were obtained using the rim composition of minerals. Calculations based on the assemblage quartz + muscovite + biotite + plagioclase + garnet indicate the eclogite facies metamorphic conditions (P = 14.4 ±6.1 kbars and T = 643 ±100 °C). They imply the lack equilibrium between plagioclase and the rest of minerals within the analysed samples.

Summary and conclusions

The P-T metamorphic conditions recorded by the metapelites from the Bystrzyckie Mts are within the HP range of the greenschist facies, close to the field of the blueschist facies. Since, both the analysed samples were collected in the same outcrop, the obtained results cannot be taken as representative for the whole Bystrzyckie Mts. Nevertheless, the present data already suggest a significant difference between the P-T conditions recorded by the investigated metapelites and those from the eastern part of the Orlica-Śnieznik dome. This preliminary conclusion should be verified and possibly extended by further extensive petrological studies in other parts of the Bystrzyckie Mts.

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Oxygen Isotope Plagioclase-Based Palaeothermometry and Whole Rock Isotope Dating in the Ślęża Ophiolite Can Be Unreliable.

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Introduction

Stable isotope analysis is one of the most valuable geochemical techniques available to constrain the conditions of formation and alteration of rocks. Likewise, it is a very useful tool to reconstruct the history of tectonic and metamorphic processes when mineral recrystallisation, fluid infiltration and volatilisation take place. Oxygen isotope data can help understand: fluid