

**THE IMPORTANCE OF PRE-350 MA AGES IN ECLOGITES FROM THE ORLICA- ŚNIEŻNIK COMPLEX, BOHEMIAN MASSIF, POLAND**

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In the Orlica-Śnieżnik complex (OSC), eclogites and HP granulites occur as isolated lenses within partially migmatized orthogneisses. There seems to be a general consensus that most orthogneisses have Cambrian-Ordovician protolith ages and that all rock types underwent at least one episode of high-temperature metamorphism during Variscan times (~340 Ma). Although geochronological results are practically indistinguishable, textural relationships suggest that an eclogite-facies stage preceded amphibolite-facies metamorphism. A key aspect for a better understanding of the OSC history and a challenge for geochronological studies is the necessity to look through the metamorphic overprint at ~340 Ma. A previous study of eclogites and associated gneisses from the location Nowa Wieś has indicated that geochronological information related to earlier events was possibly not completely erased by the last metamorphism. BAKUN-CZUBAROW (1968) reported K-Ar phengite and biotite dates of ~380 Ma for both an eclogite and a country rock gneiss from this location. These results are similar to recently reported Lu-Hf garnet ages of HP granulites (SZCZEPANSKI et al., 2004) and ionprobe U-Pb monazite ages of orthogneisses (GORDON et al., 2003) from the study area. However, caution is warranted in assigning geological significance to the K-Ar data, because the presence of excess <sup>40</sup>Ar leading to geologically meaningless dates was documented for many HP and UHP occurrences. By means of <sup>40</sup>Ar - <sup>39</sup>Ar, Rb-Sr, Sm-Nd and U-Pb dating, we have investigated the geological significance of the Nowa Wieś dates. <sup>40</sup>Ar - <sup>39</sup>Ar dating of phengite from the eclogite yielded an age of 390.3 ± 1.4 Ma. For the same sample, both the Rb-Sr (phengite, omphacite) and the Sm-Nd (garnet, omphacite) methods provided considerably younger ages (346.3 ± 2.7 Ma and 352.2 ± 3.4 Ma, respectively), which are in good agreement with results for similar occurrences throughout the Bohemian Massif. Two different country rock gneisses yielded Rb-Sr (biotite, whole rock) ages of 321.6 ± 3.2 Ma and 278.8 ± 2.8 Ma, indicating late orogenic processes and/or retrograde disturbance. Our results suggest that contamination by excess Ar has caused ~380 - 390 Ma dates without geological significance. This conclusion is further corroborated by an exotic <sup>40</sup>Ar - <sup>39</sup>Ar date (455.4 ± 1.8 Ma) for another eclogite occurrence from the OSC.

**References**

- BAKUN-CZUBAROW, N. (1968): Arch. Mineral., 28, 244-371.  
GORDON, S., SCHNEIDER, D.A., BUDZYN, B. & MANECKI, M. (2003): GSA Abstracts, Vol. 35 (6), 638.  
SZCZEPANSKI, J., ANCZKIEWICZ, R., MAZUR, S. & THIRLWALL, M. (2004): Pol. Tow. Mineral. Prace Spec., 24, 365-368.