

Different types of rock alteration, namely K-metasomatism, silicification, chloritization, carbonatization, ev. tourmalinization and biotitization, are widespread in these deposits. Also a presence of numerous iron deposits of Lahn-Dill type documents the Devonian submarine hydrothermal and exhalative activity. Convective geothermal systems accompanying crustal extension in the Devonian comparable to modern systems at spreading centres are assumed to have existed in this region.

## GEOCHEMICAL EXAMINATIONS OF MOLDANUBIAN AMPHIBOLITES FROM THE WALDVIERTEL (AUSTRIA)

O. MONTAG, V. HÖCK

*Institute of Geology, University of Salzburg, 5020 Salzburg, Hellbrunnerstr. 34, Austria*

According to Tollmann (1985), Fuchs (1986) and Weber & Duyster (1990) three units can be distinguished in the Moldanubikum: the Ostrong-unit, including the "Monotone Serie" with its cordierite-gneisses, a few orthogneisses and calcsilicate-schists. The Drosendorf-unit, separated from the Ostrong-unit by a narrow granulitic layer consists of orthogneisses at the bottom and of the "Bunte Serie" – a succession of paragneisses, amphibolites, quartzites, calcsilicate-schists and graphite bearing marbles in its upper parts. The Gföhl unit finally is marked by the Gföhl Gneiss, granulites, ultramafites, amphibolites and anorthosites. There are two main amphibolitic bodies. The first, east of the Gföhl Gneiss is named Rehberg amphibolite, the second west of it is named Buschendlwand layer. At the base of the Gföhl Gneiss there are amphibolites north of the Danube as well as south in the Dunkelstein Forest.

Careful fieldwork indicates that in some amphibolite bodies, despite their medium- to highgrade metamorphism, relicts of old magmatic textures are recognizable. An interlayering of coarse-grained and fine grained amphibolites can be easily interpreted as former gabbros cut by basaltic dikes. This texture, together with the occurrence of ultramafites and basaltic-andesitic-rhyolitic volcanics on top argues for an ophiolitic origin of the Rehberg amphibolite. The composition of the mafic rocks is characterized by a slight enrichment of elements such as K, Rb, Ba, Th, and a relative depletion of Ta, P, Zr, Y etc. This distribution suggests an island arc origin for the Rehberg amphibolite, but internal relations are, due to the fact that the analyses show tholeiitic as well as calcalkalic tendencies, probably more complex.

The Buschendlwand amphibolites show cleavable relations, but the amphibolites located in the Weintal and the Dunkelstein Forest show unequivocally within plate signatures.

MOR basalts as described by Steyrer & Finger (1993) from the Raabs-Meisling unit (probably equivalents to the Rehberg amphibolites) could not be proved. The Rehberg amphibolite seems to be a relict of an ancient island arc or marginal basin above a subduction zone. It is clearly distinguishable from most of the other amphibolites and quite well comparable to the Letovice amphibolite situated north of the Moravian Svatka window (Jelínek et al. 1984).

## DATING OF THE SILVRETTA OLDER ORTHOGNEISS INTRUSION: U-PB-ZIRCON DATA INDICATE CADOMIAN MAGMATISM IN THE UPPER AUSTRALPINE REALM

B. MÜLLER<sup>1</sup>, U. KLÖTZLI<sup>2</sup> & M. FLISCH<sup>3</sup>

<sup>1</sup> *Laboratory of Isotope Geochemistry and Mass Spectrometry, Inst. of Crystallography and Petrography, ETH-Zürich, CH-8092 Zurich, Switzerland*

<sup>2</sup> *University of Vienna, Geological Department, Laboratory for Geochronology and Isotope Geology, Franz Grill Str. 9, A-1030 Vienna, Austria*

<sup>3</sup> *Brückfeldstr. 23, CH-3012 Berne, Switzerland*

The crystallisation age of the **main intrusive suite** in the upper austroalpine Silvretta Nappe (Flüelagranitic association) is assumed to be **Ordovician** (Rb/Sr whole rock isochron, 450±2 Ma). Together with the Simano Augengneiss and the Berisal gneiss in the penninic region of the Alps (Köppel et al., 1980), the suite appears to be part of the Central and SW-European tectonomagmatic event of Heinisch and Schmidt (1982), which took place in Ordovician to Silurian time. The other important intrusive series in the Silvretta nappe consist of older, mainly calc-alkaline (Flisch, 1989), basic to intermediate and granitic rocks known as **older orthogneisses** (Grauert 1969). The crystallization age of the older orthogneisses was previously only roughly estimated to be Precambrian (approx. 600