

U-PB ZIRCON AGES OF THE AUSTROALPINE SECKAU NAPPE BASEMENT (EASTERN ALPS): HINTS FOR PRE-ALPINE MAGMATISM

MANDL, Magdalena* (1); KURZ, Walter (1); HAUZENBERGER, Christoph (1); KLÖTZLI, Urs (2)

1: Institute of Earth Sciences, NAWI Graz Geocenter, University of Graz, Austria; 2: Department of Lithospheric Research, University of Vienna, Austria

m.mandl@uni-graz.at

Seckau Nappe, Rannach Formation, LA-MC-ICPMS, U-Pb zircon ages

The Seckau Nappe in the Eastern Alps forms part of the Silvretta-Seckau Nappe System and represents the lowermost unit of the Upper Austroalpine Nappe Complex. It is built up of a pre-Alpine crystalline basement dominated by paragneisses (partly anatexitic) and amphibolites in which intrusive rocks, mainly granites and granodiorites as well as pegmatites, intruded. The so-called Rannach Formation, consisting of Permian to Mesozoic metasediments, forms the sedimentary cover of this pre-Alpine basement.

In order to clarify the timing of magmatic emplacement of the granitoids within the Seckau Nappe, as well as its tectono-metamorphic history we present LA-MC-ICPMS U-Pb zircon ages. Detrital zircons from paragneisses yield Precambrian ages between 570 ± 8 Ma and 563 ± 7 Ma and occasionally contain large amounts of older inherited cores with ages around 2 Ga. This part of the crystalline basement is likely related to the Cadomian orogeny and was later affected by two intrusive events: (1) intrusion of granitoids in the period between 506 ± 7 Ma and 494 ± 4 Ma and (2) early Variscan magmatism between 374 ± 4 Ma and 359 ± 8 Ma. During the subsequent Variscan amphibolite-facies metamorphism most of these intrusive rocks were transformed into two-mica gneisses.

Detrital zircon analyses of eight meta-sedimentary rocks from the Rannach Formation show altogether six concordant age populations. The oldest zircons show individual ages in the range from 2.6 Ga to 2.0 Ga. Further zircon ages cluster between 561 ± 9 Ma and 545 ± 11 Ma, 513 ± 5 Ma and 504 ± 16 Ma, and 482 ± 13 Ma and 461 ± 5 Ma. Variscan ages fall in the interval between 382 ± 11 Ma and 344 ± 8 Ma and the youngest zircon population represents ages in the range from 308 ± 7 Ma to 290 ± 10 Ma.

U-Pb zircon ages of the meta-granitoids of the Silvretta-Seckau Nappe indicate massive pre-collisional magmatism in the early and middle Palaeozoic. Detrital zircon ages from the Rannach Formation suggest that the sedimentary provenance is not only restricted to the Silvretta-Seckau Nappe System.