Ber. Inst. Erdwiss. K.-F.-Univ. Graz	ISSN 1608-8166	Band 20/1	Graz 2014
PANGEO AUSTRIA 2014	Graz, 14. September 2014 – 19. September 2014		

Polyphase metamorphism at the southeastern part of the Paleozoic of Graz

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Petrological investigations on metapelites and metamarls from the Raasberg Mountain (Styria/Austria) in the south-eastern part of the Paleozoic of Graz (GP) points to a polymetamorphic evolution. Chemical zoning pattern of garnets from mica schists show distinct cores with low X_{Gro}-values of about 0.05 and rims with significantly higher X_{Gro}-values of about 0.2. Moreover, the zoning of one garnet suggests a three phase metamorphic evolution. Amphibole compositions from hornblende bearing schists, plotted after Laird and Albee (1981) indicate P-T-conditions at greenschist-/amphibolites facies transition. These results are supported by geothermometric calculations based on pressure independent reactions resulting in temperatures between 550°C and 595°C (at 0.4 GPa). These conditions were reached during the latest metamorphic overprint in these rocks which is assigned to be eo-Alpine (Cretaceous) based on regional considerations.

Recent mapping revealed that the investigated rock series is overlying the Schöckl Nappe with a tectonic contact, and forms most probably the stratigraphic base of the overlying dolomitic and calcitic marbles forming the summit of Raasberg Mountain. We propose the name Gösselhof Complex for the investigated rock series and Gschneidt Nappe for the tectonic unit overlying the Schöckl Nappe.

The GP is tectonically overlying Upper Austroalpine basement nappes, which have been formally described by the term Angercrystalline unit (ACU). Also the lithostratigraphic units forming the ACU show a polyphase metamorphic evolution and an amphibolite facies metamorphic overprint during the eo-Alpine event. Chemical zoning of garnets from the Wölz and Rappold Complex show remarkable similarities to those from the Gösselhof Complex and their cores have been dated to be Permian (~270 Ma) in age (Röggla, 2007).

It is concluded that the Gschneidt Nappe represents a polymetamorphic unit. In pre-Alpine time it experienced at least a Permian and possibly also a Variscan metamorphic overprint. During the eo-Alpine event lower amphibolite facies conditions were reached, which is more than expected so far.

References

Laird and Albee (1981): Pressure, temperature, and time indicators in mafic schists: Their application to reconstructing the polymetamorphic history of Vermont, Amer. J. Sci. 281, 127-175.
Röggla, M. (2007): Petrographie und Petrologie des Anger Kristallins, Steiermark. Magisterarbeit, Karl-Franzens-Universität Graz, 167 pp.