

THREE PHASE GARNET GROWTH IN THE SOUTHEASTERN GRAZ PALEOZOIC AND ADJACENT ANGER CRYSTALLINE UNIT

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Chemical zoning patterns as well as textural evidence from garnet porphyroblasts from the Raasberg Mountain (Styria/Austria) in the southeastern part of the Graz Paleozoic (GP) point to a polymetamorphic evolution. Similar patterns are also found in the underlying Austroalpine crystalline complexes, referred to as Anger Crystalline Unit (ACU). The investigated micaschists of the GP belong to the Gösselhof Lithodeme, which is part of the uppermost Gschnaidt Nappe which is underlain by the Schöckel Nappe and the lowermost Gasen Nappe (MATURA & SCHUSTER, 2014). The underlying ACU consists of the Rossegg, Rappold, Wölz and Schoberkogel complexes belonging to nappes of the Koralpe-Wölz Nappe System. Similarities of garnet zoning patterns from micaschists of the Gösselhof Lithodeme (Fig. 1A) and the Schoberkogel Complex (Fig. 1B) include low X_{Grs} values of about 0.05-0.10 in the core and discontinuous eo-Alpine (Cretaceous) rims with significantly higher X_{Grs} values of about 0.20. Between the garnet core and eo-Alpine rim another discontinuous growth zone can be observed. The three stage growth pattern of garnets raises the question about the polymetamorphic history of the GP and adjacent ACU and may indicate three different metamorphic events (Variscan, Permian, eo-Alpine). However, it may also represent a two stage growth during the Permian event possibly due to a change in the garnet forming reaction followed by the eo-Alpine overprint. Only Permian ages of ~270Ma were obtained from garnet cores of the Rappold and Wölz complexes using the Sm/Nd method and are supported by U/Pb microprobe ages of monazite inclusions. The comparable growth pattern may have important consequences for the internal nappe structure between the eastern margin of the GP and its underlying ACU.

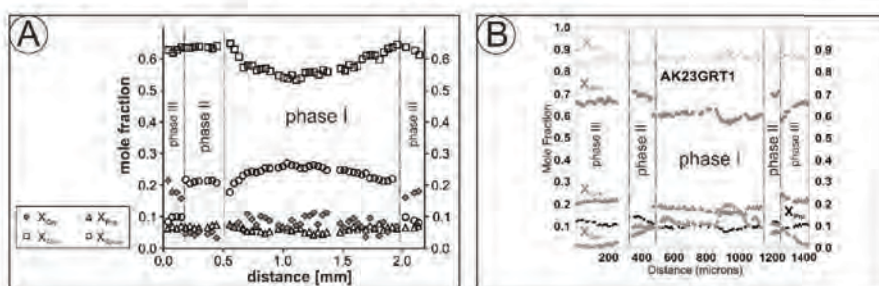


Figure 1. Garnet profiles indicate a three phase growth for the (A) Gösselhof Lithodeme/GP and (B) Schoberkogel Complex/ACU.

MATURA, A., SCHUSTER, R., 2014: Geologische Karte der Republik Österreich 1:50000, Blatt 135 Birkfeld. Verlag der Geologischen Bundesanstalt, Wien.