CHEMICAL GARNET ZONATION: A COMMON CHARACTERISTIC OF THE UPPER AUSTROALPINE MILLSTATT COMPLEX AND LAAS UNIT

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Garnets from micaschists of the northwestern Texel Complex west of the Tauern Window, usually known as Laas Unit, show a distinct garnet zonation pattern with a grossular rich plateau-like core overgrown by a grossular poor rim (HEINISCH, 2014). This "Laas type"-pattern is in close accordance with zonation patterns from the Millstatt Complex east of the Tauern Window (CIRIELLO, 2017), fitting well to a common tectonometamorphic evolution of the Millstatt Complex and Laas Unit before formation of the Tauern Window in the Oligocene (KRENN et al., 2011). Both complexes experienced eo-Alpine staurolite facies metamorphism but additionally an earlier Permian metamorphism is concluded from the frequent occurrence of Permian pegmatites.

"Laas type" zonation patterns are also observed in garnets from the southern Ötztal Complex north of the Laas Unit and Schneeberg Synform where decreasing eo-Alpine metamorphic conditions below staurolite stability are evident (HOINKES, 1981). However, in this region the "Laas type"- garnet patterns exhibit an additional outermost discontinuous rim zone starting with a grossular-rich composition which continuously decreases towards the outermost rim. This feature was already interpreted by PURTSCHELLER et al. (1987) as an eo-Alpine garnet generation overgrowing pre-Alpine garnets and fits to dated garnet zonation patterns in micaschists of eo-Alpine greenschist facies grade below staurolite stability from the northern Wölz Complex east of the Tauern Window (SCHUSTER & FRANK, 1999).

The "Laas type"- garnets from the southern Ötztal Complex were observed in micaschist layers incorporated in steep vertical fold structures connecting the southern Ötztal Complex with the northern Texel Complex (Laas Unit) and possibly represent micaschists of the Laas Unit. This interpretation is supported by Permian monazite-ages obtained from the same micaschists of the southern Ötztal Complex (HEINISCH et al., 2015).

The absence of an eo-Alpine growth zone in garnets from the Northern Texel Complex (Laas Unit) and the Millstatt Complex may be explained by eo-Alpine staurolite formation on the account of pre-Alpine garnet. The stepped texture of the pre-Alpine "Laas Type" zonation pattern may indicate a two-stage formation most probably due to a change of garnet producing reactions in course of Permian and/or Variscan (?) metamorphism. However, the exact interpretation of the pre-Alpine metamorphic history needs support by further age dating.

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