

## **SPODUMENE BEARING PEGMATITES IN THE AUSTROALPINE UNIT (EASTERN ALPS): NEW FIELD OBSERVATIONS AND GEOCHRONOLOGICAL DATA**

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The genesis of pegmatites in the Austroalpine unit is still a matter of discussion: One school of thought bring forward the argument for a development of spodumene bearing pegmatites by fractionation of granitic parent plutons (Göd, 1989; Mali, 2004), whereas another school explains barren pegmatites as products of anatexis of metapelitic country rocks (Stöckert, 1987; Thöni & Miller, 2000; Ertl et al., 2010). In the first case the absence of co-genetic fertile granites render the model problematic, whereas in the second case the formation of suitable Li-enriched pegmatitic melts is not yet understood. According to Schuster & Stüwe (2008) the pegmatites formed during lithospheric extension in Permian time, which caused basaltic underplating, high temperature / low pressure metamorphism and intense magmatic activity. In an ongoing project the relation of the barren and spodumene bearing pegmatites, their genesis and the distribution of the fractionated pegmatites is investigated.

New Sm/Nd data prove a Permian age for spodumene bearing pegmatites. A pegmatite located at Hohenwart mountain (Niedere Tauern) yield  $264.3 \pm 2.7$  Ma, another one from Lachtal (Niedere Tauern) is  $268.8 \pm 2.8$  Ma, and for a pegmatite from Mitterberg (Übelbach valley)  $266.5 \pm 2.8$  Ma were determined. Field observations show that Permian pegmatites occur in three different domains: (1) Networks of narrow pegmatitic dykes, pegmatitic patches and larger feldspar dominated pegmatites formed by accumulation occur in aluminosilicate bearing, garnet rich micaschists and gneisses with indications of initial anatexis. (2) Inhomogeneous leucogranites with a mineral assemblage of feldspar, quartz, muscovite, garnet and tourmaline. Transitions to pegmatites appear as a few kilometres long and a few hundred meters wide bodies. (3) Distinct pegmatite dikes usually with discordant contacts to schistosity of the country rocks and local appearance of spodumene and beryl. New spodumene bearing pegmatites were discovered at Falkenberg (Judenburg, Styria), Katzbachgraben (Gleinalpe, Styria) and Millstätter Seerücken (Karinthia). More than 150 trace elements measurements on cm-sized magmatic muscovites show an increase of Li, Rb, Cs, Sn, Nb, and Ta starting from pegmatitic patches and feldspar dominated pegmatite dikes, via leucogranitic bodies to discordant pegmatite dikes. Further investigations will deal with the processes of melt production, melt accumulation and fractionation.