

**FORMATION OF VEINS IN THE TAUERN WINDOW RELATED TO
CONTINENTAL ESCAPE IN THE EASTERN ALPS: CONSTRAINTS FROM $^{40}\text{Ar}/^{39}\text{Ar}$
DATING OF ADULARIA AND WHITE MICA**

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Formation of open, crystal-filled extension veins within the Tauern Window of the Eastern Alps (Austria) has been dated by $^{40}\text{Ar}/^{39}\text{Ar}$ incremental laser ablation of adularia and white mica bulk-grain samples separated from up to cm-large free crystals. Dating of chlorite has not been successful because of the low Ar-content. As adularia and white mica from the same locality report similar ages, we conclude that temperatures for vein formation were lower than the respective closure temperature for the Ar-isotopic system in K-feldspar (c. 250°C), and interpret these ages to directly date crystallisation within, and therefore formation of, these open veins. Although Ar-release spectra and $^{36}\text{Ar}/^{40}\text{Ar}$ vs. $^{39}\text{Ar}/^{40}\text{Ar}$ isotopic correlation plots indicate variable contributions of extraneous ^{40}Ar -components to the isotopic systems, results indicate three different pulses of vein formation. We do not observe any correlation between the dated minerals (e.g. muscovite or adularia), the metamorphic isogrades, the obtained ages, or with the amount of incorporated extraneous ^{40}Ar -components. The ages obtained are significantly different, and indicate: (a) a first pulse at c. 19 Ma (one muscovite, three adularia analyses) is interpreted

to closely date formation during ca. ESE-WNW extension in accommodation zones along a strike-slip zone (Möll valley fault), which separates distinct culminations of the Tauern metamorphic dome. A second event (b) at c. 15 Ma (two muscovite, three adularia analyses) is interpreted to represent a distinct thermal pulse which coincides in age with a weak thermal pulse found in mylonites of adjacent, overlying nappes. One well defined analysis (c) of an adularia found in the western part of the Tauern Window reports an age of c. 13 Ma and coincides with regional cooling found by zircon fission track dating. We conclude, that the new $^{40}\text{Ar}/^{39}\text{Ar}$ ages presented in this study closely date three pulses of fluid flow during exhumation of the Tauern metamorphic core complex, which was associated with c. orogene-parallel extension and continental escape of hangingwall Austroalpine units in the Eastern Alps.

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