



K-Ar dating of sinistral deformation in the upper Schieferhülle, south-western Tauern Window (Eastern Alps)

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The south-western margin of the Tauern Window consists of a steeply-dipping, ENE-striking structure, affecting the Upper Schieferhülle and part of its neighbouring units, respectively the Zentral Gneiss in the north and the Austroalpine basement in the south. The dominant fabric of this steep zone is a S2 foliation, striking and dipping parallel to the steep zone mentioned above, and overprinting the early Alpine S1 foliation, which forms the structural grain of the Tauern Window. This second Alpine foliation is only observed within late Alpine shear zones. In the western part of this structure, which strikes over a length of almost 40km from Sterzing to the Weißenbach Valley, shear sense indicators associated with the steep S2 foliation are consistently sinistral. However, shear sense indicators in the eastern continuation of this structure, i.e. in the Ahrn Valley become rare and partly indicate opposing shear senses.

We used the K-Ar method to date the formation of this S2 foliation from six carbonate schist samples collected in the Upper Schieferhülle of the lower Ahrn Valley between Steinhaus and St. Jakob. The main foliation consists of a very fine-grained mixture of white mica, chlorite and in one sample also paragonite. Relicts of a folded S1 foliation are still preserved. Shear bands and sigma clasts in the YZ section of the deformation ellipsoid indicate that a vertical displacement took place in addition to the strike slip component of deformation.

We analysed a mixture of white mica (52-79%) and chlorite (21-48%) in a clay fraction ($<2\mu\text{m}$). The modal composition of the fraction was determined by x-ray diffraction using a Guiner camera. Argon was measured on a GD150 noble gas mass spectrometer and the potassium content of the samples was determined by flame photometry. The obtained age values vary between $13.5\pm 1.5\text{Ma}$ and $16.8\pm 2.6\text{Ma}$.

The investigated sinistral shear zone is inferred to result from the northward convergence of the South-Alpine indenter. N-S shortening was partitioned into upright folds and shear zones, which nucleate at the western corner of the South-Alpine indenter. Therefore, the inferred formation of the foliation, suggests that indentation was still going on between 19 and 12 Ma.