

HIGH DIAGENESIS AND ANCHIMETAMORPHISM IN PERMOTRIASIC SEDIMENTS OF THE SOUTH WESTERN PART OF THE KARWENDEL MOUNTAINS PRELIMINARY RESULTS

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Location: Our research area is part of the Austroalpine and lies in the Northern Calcareous Alps, in the southern part of the Karwendel Mountains between Innsbruck and Zirl, Tirol, Austria.

Anisian to Ladinian sedimentary rocks of the Northern Calcareous Alps from the area between the Höttingergraben in the east and the Ehnbachklamm in the west have been sampled in several stratigraphic sections, recorded in great detail.

In the Inntal Nappe in the vicinity of Innsbruck the sediments underwent high-grade burial diagenesis with maximum temperatures of about 180° C (KÜRMANN 1993).

According to KRUMM (1984) there is a broad margin of "anchimetamorphic" influence within the southern part of the Northern Calcareous Alps, in the area of the Mieminger and Wetterstein mountains showing even a strong extension towards the north (reaching the area of Garmisch-Partenkirchen).

The target of our analysis is to gain more information about the genesis and dimension of the Middle Triassic sediments through an sedimental-petrographical description and to get an survey of their locally distribution. The thermal overprint raises two questions: is the whole stratigraphic succession influenced in the same dimension and is it possible to make a time correlation?

To gain new informations we use the following three methods:

- 1) The illite crystallinity combines several parallel occurring maturity processes of the potassic white mica and allows to draw conclusion about the grade of anchimetamorphism. With increasing diagenesis neomorphic potassic white mica develop increasingly sharper inflexion maximums in the X-ray diffraction diagram. This effect is called "sharpness ratio" by WEAVER (1960). To minimise errors caused through the input of detritic potassic white mica WEAVER (1960) suggests the analysis of fractions below 2 micron. In these fractions neomorphical potassic white mica dominates over detritic minerals. To reach more precise results KUBLER et al. (1967) suggest to evaluate the half width. With increasing grade of diagenesis the half of the reflection width value (in nm) decreases due to increasing crystallinity. The (silicate) mineral residue, fraction below 2 micron, resulting from solution in formic acid, is examined mineralogically. Its mica content proved to be markedly homogeneous, containing mainly di-octahedral illite minerals. X-ray diffraction analysis furnishes reliable information about the compositional and structural properties of authigenic clay minerals even in polyphase mixtures.
- 2) Through vitrinite reflexion analyses of the Raibl beds between Thaur in the East and Zirl in the West we want to observe paleogeothermic influences in detail, especially of the reflectance data and by stratigraphical assignment of the samples. The predominant region-

al tendency is a general increase of the maturity from north to south (PETSCHICK 1989).

- 3) The conodont alteration index which also indicates the thermal overprint, is already proved in some limestones of the Triassic succession through our own preliminary analyses (personal communication KRYSSTYN, Vienna).

The results of these analyses will be compared and correlated as far as possible.

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