Standardisation, calibration and correlation of the Kübler-Index

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A multiple inter-laboratory Kübler-Index (KI) calibration with illite Kübler-Frey-Kisch (KFK) standards is presented and compared with KI values calibrated with CIS standards as used in the last two decades in very low-grade metamorphic studies. Comparing both data sets the CIS values show a higher full width at half-high maximum peak intensity. In all cases due to broadening effects on the CIS KI, a shift of zone-limits, specifically the diagenetic zone/anchizone boundary, is produced in geographical dimensions in a metamorphic map-view. A comparison with coal indices and index minerals will demonstrate some discrepancies between the CIS values and KFK calibrated KI shown in a pressure-temperature diagram with the subdivisions of diagenesis and sub-blueschist and sub-greenschist facies.

Combining standardised KI and vitrinite reflectance (VR) measurements a coherent data set for compilation studies can be generated from the data of different research groups. This attempt to establish a unified database of independent measures to determine diagenetic/metamorphic zones with different analytical instrumental methods are indispensable to present metamorphic maps at very low-grade conditions. Given that the KFK standards are difficult to preserve for the future and presumably they will be replaced with ongoing time by the CIS standards, a rescue of the laboratory settings from Frey, Kübler and others is done.

After having compiled the KI – VR zones for the "New Metamorphic Map of the Alps", the presented calibration and inter-laboratory correlation gives a chance to save the KI values obtained by very different preparation procedures applied. This is an important step for further studies in an area like the Central Alps with a very high data grid. Using the same calibration and preparation technique no fundamental problem in data comparison is achieved for VR data operation. The main problem arises when rock maturity is compared with CIS calibrated KI values. KI values obtained by the CIS calibration are not compatible with KFK calibrated KI. Nevertheless, it is evident that a uniform use of CIS and KFK-KI standardisation procedure is needed to avoid confusions and different scales for determining diagenetic grade and incipient metamorphic grade.