

REMAGNETIZATIONS IN THE VARISCAN OROGEN AND FORELAND IN CZECH REPUBLIC AND POLAND: TIMING, ORIGIN AND LINKS WITH OROGENIC PROCESSES

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It is well known that Devonian rocks in the Moravo-Silesian zone (MSZ, eastern Variscides) and in the southern Holy Cross Mts (sHCM, Variscan foreland, Central Poland) were affected by multiple remagnetization events. Both regions were situated in different parts of orogenic system what resulted in contrasting styles of deformation, tectonothermal histories and remagnetization scenarios. The MSZ represents an accretionary wedge, of mostly NW-dipping tectonic slices, developed between the overriding nappe stack of the Moldanubian - Teplá-Barrandian units, and the subducted Brunovistulian crystalline basement. The main folding and thrusting events took place in the Late Carboniferous, close to the Westphalian/Stephanian boundary. These late stages of deformation are conspicuously indicative of a strong regional shear zone. The published thermal-maturity data from the Moravian part of the MSZ (vitrinite reflectance, illite crystallinity and quantitative CAI data) correspond to the maximum burial temperatures ~100 to ~200°C in the S to SE part, up to ~330°C in the central part. On the other hand sHCM underwent faulting and folding in a generally transpressive regime of the main phase of the Variscan inversion in the late Westphalian-Stephanian, without development of nappes. The present-day maturity of the organic matter in the Devonian displays a pattern of elevated values in its N part (max. burial temperatures 130-150°C) and gradually decreasing to the S and E (80-100°C). Secondary magnetization components in both regions are related mostly to magnetite, subordinately pyrrhotite. In the MSZ, syn- to postfolding remagnetization phenomena were extended in time between 330 and 280 Ma and only rarely an older, probably Viséan overprint was preserved in the less thermally altered areas. Also in the sHCM, the post-folding overprint of 290-270 Ma age, is evident in the areas of higher thermal alteration, while Viséan overprint is relatively common in the less altered areas. Correlation of thermal indices with Late Carboniferous/Early Permian components proves that the latter were most probably thermoviscous remagnetizations acquired during cooling/uplift processes. It is further confirmed by results of burial-thermal modelling of borehole sections. Significantly earlier onset of the Late Carboniferous/Early Permian remagnetization in the MSZ than sHCM, may indicate that cooling/uplift processes spread from the inner to outer parts of the Eastern Variscan orogen.

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