



Relocated micas in marble – indicators for postdeformational microfabric modification

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A relocation of mica grains in marbles can be observed as trace of newly precipitated calcite material in cathodoluminescence microscopy analysis. Mica grains relocate by rotation and/or translation from foliation parallel to new irregular orientations. The mica grains can be either located at calcite grain boundaries or within large calcite grains.

The process erases deformed, inclusion-rich calcite material and creates undeformed and mostly inclusion-free grains and can therefore be regarded as postdeformational. Not every mica present relocates and the choice of whether a specific mica relocates cannot be related to a specific primary orientation. Furthermore, no significant difference in composition between relocated and non-relocated mica grains can be observed. Newly precipitated calcite has less Mg than the dissolved grain material.

The precipitation of new calcite material at the calcite-mica interface is supposed to be the initial trigger leading to dissolution of inclusion-rich, deformed calcite material at the opposite side of the mica grain. The newly precipitated calcite material inherits the already existing calcite grain's crystallographic orientation.

Assuming this process occurs to a larger extent in a material, it might modify a deformation-related microfabric. Therefore, an interpretation in terms of deformation conditions should be done carefully, considering postdeformational dissolution-precipitation processes.