

Zusammenfassung

Zechstein (Z1) rocksalt from the Fulda basin, from the immediate vicinity of the Hessen potash bed is folded into tight to isoclinal folds which are cut by an undeformed, 1 cm thick, coarse-grained halite vein. Microstructures were investigated in etched, gamma-irradiated thin sections from both the wall rock and the vein. The lack of synsedimentary dissolution structures and the widespread occurrence of plate-shaped and hopper grains in the wall-rock suggests that the sedimentary environment was perennial lake. Deformation microstructures are in good agreement with solution-precipitation creep process, and salt flow under very low differential stress. Strength contrast between anhydrite-rich and anhydrite-poor layers caused the small scale folding in the halite beds. The vein is completely sealed and composed mainly of euhedral to subhedral halite grains, which often overgrow the wall-rock grains. Those microstructures, together with the presence of occasional fluid inclusion bands, suggest that the crystals grew into a solution-filled open space. Based on considerations on the maximum value of in-situ differential stress, the dilatancy criteria, the amount of released fluids from the potash bed during metamorphism and the volume change, it is proposed that the crack was generated by hydrofracturing of the rocksalt due to the presence of the salt-metamorphic fluid at near-lithostatic pressure.