Geophysical Research Abstracts, Vol. 6, 03330, 2004
SRef-ID: 1607-7962/gra/EGU04-A-03330

MICROSTRUCTURES OF HALITE FROM HIGHLY STRAINED ROCKS IN KLODAWA SALT WALL, CENTRAL POLAND

Z. Schleder (1), S. Burliga (2), J. L. Urai (1)

(1) Geologie-Endogene Dynamik, Aachen University of Technology, Germany (z.schleder@ged.rwth-aachen.de), (2) Institute of Geological Sciences, University of Wroclaw, Poland (burliga@ing.uni.wroc.pl)

This work was aimed at recognition of deformation mechanisms, paleostress and recrystallization features present within the highly strained portion of the Klodawa salt wall, central Poland, at the mine level 600. This salt structure consists of Zechstein evaporates (Z1 to Z4) which, at least between the Triassic and the Tertiary, underwent complex deformation history, resulting in variable strain of the rocks. At present, low, medium and highly strained domains can be distinguished in the structure. The highly strained zones are characterized by the occurrence of sheared sheath folds of several tens of metres height and very narrow width, and drastic thickness reduction of lithostratigraphic units.

The halite samples were studied with the following techniques: (i) transmitted light microscopy of gamma-irradiated thin sections, (ii) subgrain size palaeopiezometry of polished and chemically etched samples, and (iii) microchemical analysis by ICP.

The sampled rock salts have grain size between 0.5 and 1.5 cm on average, although 5-10 cm grains also locally occur. Gamma irradiation revealed that the grain size is one of the dominant factors controlling the deformation mechanism observed in the sampled rock salts. Cross-slip is the main deformation mechanism in the coarse grain salt, while the fine grain ones basically show evidence for extensive subgrain formation and grain boundary migration. Lobate shapes of majority of grains indicate, however, that the grain boundary migration was the common process in all rock salt types in this highly strained portion of the salt wall. Subgrain size documents differential stress of up to 1.7 MPa.

In a few samples, euhedral, stress-free new grains are observed, which occasionally

possess remnants of old, highly deformed grains. They point to local static recrystallization, however the controls on this process and distribution of strain free euhedral grain is temporarily not fully understood.