

Rock salts and enclosed fluid inclusions – a preliminary study from the Carpathian Bend Zone

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Rock salts play a significant role in controlling the structure and geometry of fold and thrust belt system (Davis & Engelder, 1985). In the Carpathian Bend Zone, two major evaporitic levels can be distinguished with Lower Burdigalian and Badenian ages. However, there is an uncertainty in age dating due to the ongoing deformation process in the area (Schléder et al. 2019). This study provides a detailed description on petrographic (rock and fluid inclusion) features of a series of 30 rock samples collected from 4 locations (Slănic Prahova, Bisoca, Jghiab, Mânzăleşti - Romania) which are supposed to represent both evaporitic events. Fluid inclusions were distinguished based on their origin/generation. Primary fluid inclusions indicate their entrapment during halite crystallization/recrystallization. Secondary fluid inclusions formed after halite crystallization thus, provide evidence on fluid migration events during rock salt deformation.

Most of the samples contain primary fluid and secondary fluid inclusions, which are present in all samples from the 4 locations with various shapes and phases as discussed below. Samples from Slănic Prahova are characterized by dissolved grain boundaries caused by karstification. Although the rock is composed mostly of halite, anhydrite-rich clusters are also observed. Indication of hydrocarbons (dark brown-opaque material in irregular shapes) was found along intracrystalline cracks and halite grain boundaries, which are associated with networks of vermicular shaped, late-stage secondary fluid inclusions. Most of these samples contain both types of inclusions in varying abundance. The Bisoca samples are built up by large (>1 cm) halite chunks with intracrystalline cracks. Primary fluid inclusions are present in samples along transitional zones between the halite and the clay mineral-rich parts. Jghiab samples indicate effects of intense karstification, with increased porosity in the rock salt. These samples have significant detrital mineral (clay minerals) and rock fragment content. No primary fluid inclusions were observed. In the Mânzăleşti samples bimodal grain size distribution of halite and increased amount of detrital minerals (clay minerals) and rock fragments were distinguished together with highly deformed texture. Similarly to Bisoca, primary fluid inclusions were observed in halite at the clay mineral-halite interface.

Keywords: rock salt, Carpathian domain, petrography, fluid inclusions