

POLYHALITE IN MIOCENE POTASH DEPOSITS OF THE CARPATHIAN FOREDEEP, UKRAINE

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Polyhalite is a widespread sulphate mineral of potash salt deposits of the Carpathian Foredeep. It occurs as an admixture in almost all salt rocks, in some cases it forms polyhalite rock. The three most widespread varieties of polyhalite rocks are described below.

Clay polyhalite rock occurs as thin (1–10 cm) layers in the potash strata. This rock is grey coloured, with laminated, thin bedded or crossbedded structure. The rock contains 0.09 % Sr.

Red polyhalite rock occurs as thin (1–3 cm) layers and packets of layers whose thickness reaches 1–2 m. The rock is laminated with small lenticular halite grains, which are encompassed by polyhalite laminae. The rock contains 0.65 % Sr.

Polyhalite-anhydrite layers (0.3–30 cm) take place in salt bearing breccia next to the boundary of potash deposits. They are meandering, fickle along the strike and thickness. These layers consist of polyhalite (from potash deposit side) and anhydrite (from salt bearing breccia side) parts. Polyhalite is mainly parallel fibrous, the fibres are arranged across the layer. Strontium content is 0.41–2 %, average 0.74 %. At one of such layers of the Stebnik potash deposit in which polyhalite is replaced by gypsum, kalistrontite, a rare sulphate of K and Sr was found (HRYNIV *et al.*, 1986).

The concentration of brines needed for polyhalite precipitation is reached at the end of the halite stage. Although the possibility of polyhalite precipitation from brines is confirmed by experimental data (VALIASHKO & NECHAEVA, 1952), more likely is the formation of polyhalite through early diagenetic replacement of primary gypsum (VALIASHKO, 1962; BRAITSCH, 1971). Clay polyhalite rock was formed during early diagenetic replacement of gypsum layers, red polyhalite rock perhaps also has a diagenetic origin (the signs of gypsum replacement are not seen). Polyhalite-anhydrite layers were formed during diagenesis at the geochemical barrier as the result of the reaction of sulphate brines from potash deposits and chlorine-calcium brines from salt bearing breccia. Besides, polyhalite replaces others salt minerals of potash deposits of the Carpathian Foredeep (JARZHEMSKIJ, 1954).

References

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