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PŮVODNÍ PRÁCE/ORIGINAL PAPER

## Supergénna mineralizácia na II. horizonte Východnej šachty hnedouhoľnej bane Handlová (Slovenská republika)

### Supergene mineralization at the II. horizon of the Eastern shaft of Handlová coal mine (Slovak Republic)

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#### Abstract

At the II. horizon of the Eastern shaft of Handlová coal mine the occurrence of mineral assemblage of secondary minerals was identified. These accumulations consist of sulphate group minerals confirmed by PXRD and semiquantitative chemical analysis (EDS), namely gypsum, alunogen, pickeringite, melanterite, sideronatrite and epsomite. Sulphates form coatings, crystalline crusts and aggregates, which crystallized on the walls of mine corridors. The dimensions of these accumulations are reaching approximately 1.5 x 1.3 m with thickness up to 5 cm. The refined unit-cell parameters of alunogen (for the triclinic space group  $P-1$ ) are:  $a$  7.413(1),  $b$  26.944(4),  $c$  6.051(1) Å,  $\alpha$  90.05(1),  $\beta$  97.65(1),  $\gamma$  91.82(1)°,  $V$  1197.1(3) Å<sup>3</sup>, pickeringite (for the monoclinic space group  $P2_1/c$ ):  $a$  6.1808(8),  $b$  24.252(2),  $c$  21.220(2) Å,  $\beta$  100.36(1)°,  $V$  3128.8(6) Å<sup>3</sup> and melanterite (for the monoclinic space group  $P2_1/c$ ):  $a$  14.022(5),  $b$  6.503(2),  $c$  10.945(4) Å,  $\beta$  105.83(3)°,  $V$  960.2(7) Å<sup>3</sup>. Sideronatrite and epsomite were identified in mixture with the most significant diffraction maxima for sideronatrite: 10.252/100, 4.905/37, 3.424/10, 3.067/9 and epsomite: 5.347/18, 5.302/18, 4.489/26, 4.215/100, 4.201/59, 2.880/24, 2.747/23, 2.677/18. Accumulations of minerals were formed on the mine walls. Secondary sulphates are considered as products of the weathering of Fe-rich carbonates, pyrite and other sulphidic minerals which are part of associated pelosiderites embedded in the clays and claystones. Locally, gypsum and hexahydrate were also identified in the form of transparent crystals and white powdery aggregates on the calcite speleothems genetically linked to Mesozoic limestones and gypsum-rich Lower Triassic Werfen Formation. Unit-cell parameters refined from X-ray powder diffraction data are for hexahydrate (for the monoclinic space group  $C2/c$ ):  $a$  10.107(1),  $b$  7.2114(8),  $c$  24.424(3) Å,  $\beta$  98.28(1)°,  $V$  1761.7(3) Å<sup>3</sup>.

**Key words:** supergene minerals, sulphates, alunogen, pickeringite, melanterite, hexahydrate, Handlová, Slovak Republic

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