

Genetic Model of Siderite Mineralization in Gemicum (Western Carpathians, Slovakia)

RADVANEČ, M. and GREČULA, P. Geological Survey of Slovak Republic, Bratislava, Slovakia

The Variscan siderite mineralization occurs in two modes: The first mode represents around 1300 veins are distributed in the Paleozoic sequences. The thickness of the body is ranged 1 to 10m and the length XXm to Xkm. The vertical reach 1200m occurs three sectors of one body. The uppermost sector consists barite + siderite. Deeper sector is building by the siderite + sulfides + quartz and the deepest is covered with sulfides + quartz ± siderite.

The genetic model of the siderite or body is based on the source fluid ($T=150-250^{\circ}\text{C}$; $P=3-1\text{Kbar}$; $\delta^{13}\text{C}_{(\text{PDB})} = -8$ to -13‰ ; $\delta^{34}\text{S}_{(\text{H}_2\text{S})} = +3$ to $+10\text{‰}$; $\delta^{18}\text{O}_{(\text{SMOW})} = +5$ to $+9\text{‰}$; $^{87}\text{Sr}/^{86}\text{Sr}=0.714$) derived in LP/HT Early Paleozoic regional metamorphism M1. Amount of CO_2 derived from black shales and limestones in the mixture 1limestone: 2 organic for the siderite veins located near the black shales and 1limesone: 1organic for veins in the other Paleozoic.

Second mode of the siderite mineralization has a stratiform type, was forming by the similar source fluid ($T=200-350^{\circ}\text{C}$; $P=3-4\text{Kbar}$; $\delta^{13}\text{C}_{(\text{PDB})} = +2$ to -3 <lowT or -5 to -8‰ >highT; $\delta^{18}\text{O}_{(\text{SMOW})} = +9$ to $+14$ <lowT or $+6$ to $+8\text{‰}$ >highT). The cooling of the metamorphism M1 generated the source fluid, which replaced a part of the limestone host body located in black shales, forming the siderite part in.

The younger metamorphism M2 generated a new fluid ($\delta^{13}\text{C}_{(\text{PDB})} = -6\text{‰}$ strontianite; $\delta^{34}\text{S}_{(\text{H}_2\text{S})} = +19$ to $+23\text{‰}$ celestite; $\delta^{18}\text{O}_{(\text{SMOW})} = +16\text{‰}$; $^{87}\text{Sr}/^{86}\text{Sr}=0.719-0.722$) locally replaced the siderite + barite ore body along faults probably in the Alpine time.