Zn-BEARING CINNABAR FROM RABE NEAR BALIGRÓD (BIESZCZADY MTS., OUTER CARPATIANS, SE POLAND)

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Presence of cinnabar associated with As sulphides from Rabe near Baligród was described by KARWOWSKI & SZEŁĘG (2005). This As-Hg mineralization is epigenetic and is connected with dislocated zones within sedimentary rocks (sandstones, shales, conglomerates) of the Bystre thrust-sheet (Fore Dukla unit, Silesian nappe) (ŚLĄCZKA, 1958; RYBAK, 2000). Realgar and orpiment are the main As minerals (OSTROWICKI, 1958; GAWEŁ, 1970). Cinnabar is represented by two types differing in optical and chemical properties. The first type is pure HgS, the second type contains Fe as impurity up to 0.01 *apfu* and shows lower reflectance than the first one. Cinnabar occurs together with realgar, orpiment, As-bearing pyrite, carbonates (dolomite–ankerite–siderite series), kaolinite and automorphic quartz. Chalcopyrite inclusions within cinnabar have been observed. Cinnabar crystallized before realgar.

TOMKINS *et al.* (2004), in accordance with OSADCHII (1990) and POWELL & PATTISON (1997), described sphalerite–cinnabar solid solution at temperature above 200 °C and at pressure of 1 bar. Two separate phases: Hg-rich sphalerite and cinnabar (in the $Zn_{0.80}Hg_{0.20}S$–HgS range) coexist below 200 °C. LEONARD *et al.* (1978) described a new mineral – polhemusite. Its composition is within the $Hg_{0.10}Zn_{0.92}S_{0.99}$ to $Hg_{0.22}Zn_{0.83}S_{0.95}$ range.

In this paper we report the co-occurrence of pure cinnabar together with Zn-bearing cinnabar represented by sector-zoned crystals (Fig. 1) and isolated exsolutions. Sector-zoned crystals occur outside the pure cinnabar aggregates. Dark sectors on Fig. 2 contain up to 0.12 *apfu* of Zn. Iron and silver (trace) are evenly distributed. Investigated phases are high-Zn varieties of cinnabar.

Isolated small exsolutions of Zn-bearing cinnabar (up to 5 μm) occur within pure cinnabar. The authors observed a few grains, in which Zn predominated over Hg, *e.g.* $(Zn_{0.52}Hg_{0.39}Fe_{0.09})S$. These phases are anisotropic and probably are high-Hg varieties of a mineral close to polhemusite. Pure sphalerite has not been observed. Probably, the structure of cinnabar trapped all Zn from mineralizing fluids precluding sphalerite crystallization.

References

GAWEŁ, A. (1970): Mineralogia Polonica, 1: 7–16.
KARWOWSKI, Ł. & SZEŁĘG, E. (2005): Mineralogical Society of Poland – Special Papers, 25: 318–322.
LEONARD, B.F., DESBOROUGH, G.A. & MEAD, C.W. (1978): American Mineralogist, 63: 1153–1161.
OSADCHII, E.G. (1990): Neues Jahrbuch Mineralogie. Monatshefte, (1): 13–34.
OSTROWICKI, B. (1958): Kwartalnik Geologiczny, 2: 644–653.
POWELL, W.G. & PATTISON, D.R.M. (1997): Economic Geology, 92: 569–577.
RYBAK, B. (2000): Przegląd Geologiczny, 48: 1023–1029.
ŚLĄCZKA, A. (1958): Kwartalnik Geologiczny, 2: 637–643.
TOMKINS, A.G., PATTISON, D.R.M. & ZALESKI, E. (2004): Economic Geology, 99: 1063–1084.

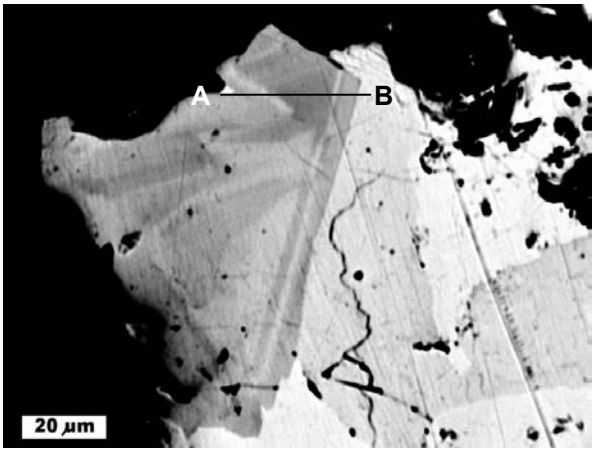

Fig. 1: BSE image of Zn-bearing cinnabar (left) and pure cinnabar (right). A–B: line scan.

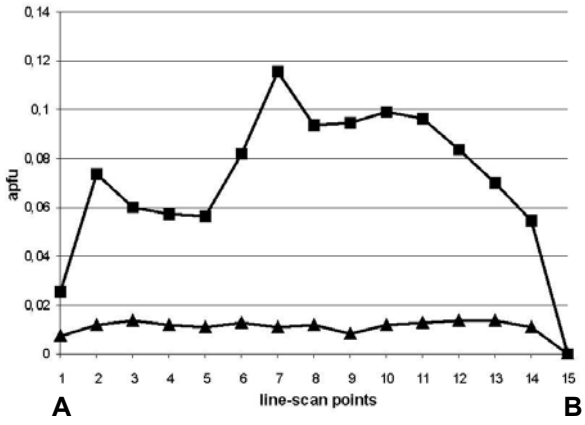

Fig. 2: Variability of Zn (■) and Fe (▲) within Zn-bearing cinnabar. A–B: line scan.