Occurrence of the colusite group minerals at the Bor ore district, Serbia

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The compounds $M_{34\pm x}S_{32}$, where M is Cu, V, As, Sb, Sn, Ge, Fe, with adition of Mo and W; $x \leq 3$, occur rarely in nature and in insignificant amounts. Minerals of this composition were described as arsenosulvanites, colusites, germanites and nekrasovites. They present basically the copper-vanadium sulfosalts of the mentioned elements and were formed in porphyry-copper, porphyry-copper-molybdenum, copper vein, volcanogenic massive sulfides, gold vein and marble deposits, in ore-bodies of quartz, quartz-barite or carbonate composition of hydrothermal genesis. Their associations include sulfides (pyrite, chalcopyrite, bornite, galena), sulfosalts (enargite, luzonite, stibioluzonite, sulvanite, mawsonite, tetrahedrite-tennantite) and tellurides (hessite). In such types of ore-deposits, the minerals of the colusite group were formed at a high oxidation potential, apparently due to the presence of As^{5+}, Sb^{5+}, Sn^{4+}, Ge^{4+}, Te^{4+}, Cu^{2+} in their composition. A great diversity is present among the members of this group as the cosequence of a very complex crystallochemistry of their minerals, for what the strongly expressed a different types of isomorphism at the third position in the colusite formula $Cu_{24+x}V_2(As, Sb, Sn, Ge)_6S_{32}$, $(0 \leq x \leq 2)$ are responsible.

The ores from the Bor copper deposit contain a small amount of the colusite group minerals, with members belonging to the subgroups of arsenosulvanite, srictly colusite and germanite, which display a significant variety in chemical characteristics, consecutively resulting in the appearance of an unusual members and in some cases, in a new species eventually. Due to the mode of their occurrence in the ore in predominantly single very small grains, mainly the chemical (EPMA) and quantitative optical investigations were performed on arsenosulvanite, Sn-rich and Sn-poor colusite, mawsonite, germanite-(W), bornite-(Ge) and sulvanite.