THE NEW TRIPLE COMPOUND IN THE SYSTEM Sb₂S₃-YbSb₂

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In the physico-chemical chalcogenide sistem A - B - C the compounds of A B₂C₄, A B₄ C₇ type being generated in the section A C - B₂C₃. These compounds, in particular, have been obtained not only with the elements of II and III B subgroups of the Periodic system (Zn, Ga, In) but also with the other ones which can display the 2 and 3 degree of oxidation, such as Mn, Cu, Yb, Eu, Ca, Sr, Ba, Sb, Bi [1,2].

However, in the triple chalcogenide system with these elements the other triple phases can be obtained as well.

In the present work the system Sb₂S₃ - YbSb₂ has been investigated by the methods of physico-chemical analysis (DTA, RPhA, MSA). Melting the patterns was carried out in the soldered, being vacuum at 10 torr, quartz ampules at 900 C. After melting the homogenizing annealing was conducted at 450 C within 200 C hours.

The state diagram has been constructed according to the results of the study. In the system a new triple compound incongruently melting has been found. Formation of this compound takes place on the basis of reaction:

\[ L + YbSb₂ \rightarrow Yb₂Sb₆S₃ \]

The temperature of peritectic reaction = 610 C composition of peritectic point = 18mol% YbSb₂. In the field of concentration Sb₂S₃ - Yb₂Sb₆S₃ the eutectic occurs at 530 C and under composition 7mol% YbSb₂. The obtained compound presents an interest as it consists of a great amount of antimony.

The semi-conductors of A B type as well as the intermetallides (Mg₃Sb₂ and oth.) in which the antimony displays, conditionally, the negative valency (-3), are well-known. In the compound Sb₂S₃ the antimony is a cation. In this connection, most probably, in the triple compound Yb₂Sb₆S₃ the antimony is of no equal worth by crystallography i.e. it can play the double role and take the different position: that of cation and anion. If should be noted as well that in the system Sb₂Te₃-YbSb₂ the triple compound is not formed [3].

LITERATURE