

DEFINITION PARAMETERS EUTECTICS

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Coordinates of high eutectic binary and quasi – binary alloys of triple systems is quite difficult to determine, since the melting point is measured by an optical pyrometer with low accuracy $\pm 500\text{C}$. In fact, the parameters of eutectics have two mutually related unknowns - the composition and melting temperature.

In the quasi-binary alloys of triple ternary systems compounds behave as simple components in binary systems. This is confirmed by the fact that the melting point of the eutectic and melting temperatures of components in eutectic systems are dependent. According to Hansen and Anderko directory in simple systems the eutectic melting temperature ratio to the amount of the T_E components melting temperatures T_A and T_B is a constant, which is equal to $0,374 \pm 0,034$:

$$\frac{T_E}{T_A+T_B} = \text{const} \quad (1)$$

Constant (1) of systems of oxide – metal, carbide – metal, nitride – metal, boride - metal is different, but constant for a given system. For all alloys of quasi - binary triple system La - Me - B constant in equation (1) is equal to $0,444 \pm 0,006$ ($\text{LaB}_6\text{-TiB}_2$ - 0,444; $\text{LaB}_6\text{-ZrB}_2$ - 0,445; $\text{LaB}_6\text{-HfB}_2$ - 0,432; $\text{LaB}_6\text{-VB}_2$ - 0,442; $\text{LaB}_6\text{-NbB}_2$ - 0,439; $\text{LaB}_6\text{-TaB}_2$ - 0,438; $\text{LaB}_6\text{-CrB}_2$ - 0,445; $\text{LaB}_6\text{-MoB}_2$ - 0,452; $\text{LaB}_6\text{-ScB}_2$ - 0,450; $\text{LaB}_6\text{-Mo}_2\text{B}_5$ - 0,448; $\text{LaB}_6\text{-W}_2\text{B}_5$ - 0,451).

Equation (1) makes it possible to determine the approximate melting point of eutectic alloys quasi - binary triple systems, but does not give the opportunity to build their state diagrams. This paper proposes a graphical method for determining the coordinates of eutectic alloys respectively quasi - binary the study of alloys of the triple system La - Me - B (Figure).

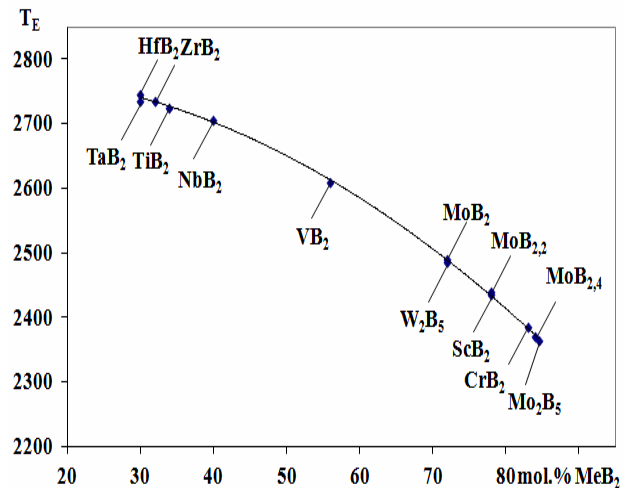


Fig. Dependence of the melting point of the eutectic boride content

As can be seen from the figure, the coordinates of eutectic alloys of the same type have a clear correlation between the melting point of eutectic T_E and molar content of the eutectic phases. Thus, in any system with a matrix phase for coordinate data established experimentally eutectics three - four alloys can construct a graph of melting temperature of the eutectic - molar content. Then unexplored for this type of system to determine the melting point eutectic temperature set constant relationship to the amount of the eutectic melting temperature of melting components (1). Drawing on curve of eutectic temperature of the molar content, we can determine the molar content of unexplored eutectic system.