Multi-component Systems Design. 
Program applications for T-x-y diagrams with 25 and 9 surfaces 
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The principles of complex program application creation for T-x-y diagram of different topological types are considered. As examples the phase diagrams consisting of 9 and 25 surfaces are chosen.

The computer technology using allows to automate the phase diagram investigation (PD) for the extraction of latent information. In this connection for the construction and research of different types T-x-y diagrams, the united complex program is developed. The structuring of information about PD structure, the elaboration of corresponding mathematical model and their realization as the algorithms and programs precede the united complex program creation.

It's necessary to consider the different variants of PD geometrical structure which can be differ by the components interaction character in binary systems at the PD computer model creation. For example, six modifications can be obtained for the diagram with the solubility gaps in two binary systems consisting from 9 surfaces. Each from these variants gives some more varieties differed by the temperatures on the liquidus lines connecting the points belonging to the different binary systems.

Analogously T-x-y diagrams with the solubility gaps in three ternary systems consisting from 25 surfaces are considered. In this case the bordering systems structure peculiarities and the temperature drop on the adjoining lines to the ternary point are taken into account [1]. As result, the eutectic, peritectic and quasi-peritectic interaction types are appeared.

The skew plane given by four points on the borders was chosen for the diagram surfaces describing [2].

The created application consist of 9 forms, each includes their unit. The association between the form units and the organization of program work are realized using unit named as Global_Unit. This unit includes both the description of all global (used by all applications) values and types and all calculation procedures and functions. Global_Unit is used all forms units. Besides Global_Unit unit there are Konods and Divline units. These units are used for the tie-lines calculation and visualization. The Matmath unit is realized the different mathematic functions and Unitnewt unit allows to solve the equation system by Newton method.

The text files with *.fd expansion containing of the all special points coordinates are employed for the diagram keeping. The application makes use such variable type as object. It choice is dictated by the perception convenience of large number of the necessary variables and the working with them.

The created program allows to construct any PD isothermal and polythermal section and n the isothermal sections of two-phase regions allows to calculate the conjugate compositions by the surface isotherms dividing on the portions with the equal length [3]. At that for T-x-y diagram with the solubility in solid phases, the tie-lines are calculated both the two-phase regions with melt and the regions with solid phases. Some application opportunities allows to study PD structure and use its for the materials computer simulation. In particular, the function of the surfaces arbitrary choice witch the user can vitalize is realized. It's allows to work with the concrete phase regions not considering others. The application opportunities permit to obtain the acsonometric diagram projections, it projection on the prism foundation, the concentration fields with the unique microstructure sets simultaneously and to rotate the prism for the more convenient perception of PD. The program constructs the arbitrary given horizontal and vertical diagram sections. The gradual temperature change with the step of 10° and simultaneous supervision over section behavior is realized for the isothermal sections. The surfaces determination from which is passed through the perpendicular restored from the given point on the prism foundation. It is necessary when it is required to define, in what phase region any point will get.

The obtained figures can be saved on the desk as bmp-files (*.bmp) and the script-files in which the commands of AutoCAD program are wrote can be created for the following figures realization.

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REFERENCES