Mathematical and Computer Modelling of Orebearing Process

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The prerequisites for modelling are served the data about features of allocation, constitution and structure of ore objects (systems): their everywhere global development in different geologic conditions; availability of zones of lowering concentrations of ore components around or near objects; an invariance of mineral structure and zonalities of deposits relatively chemizm of surroundings; existence in the fields of steady levels of concentration of ore components. These and some other features have allowed to formulate the basic axioms, on the basis of which the mathematical and computer models of orebearing process were constructed.

The program CELLS imitates redistribution of ore material in geologic surroundings, realising the idea cellular automata. It allows to mark versions of favourable conditions for formation of large ore deposits on a regional scale.

The program SINMOD imitates the formation of hydrothermal deposits, esteeming an ore formation as locally reversible process described by partial equations. The nontrivial conclusions about orebearing process were obtained (in particular, about a time-space similarity of distribution of ore material; the causes of a high non-uniformity of distribution of concentrations in ores; the factors affected on formation of rhythmicity and extremely high concentrations).

Obtained at the analysis of computer CELLS and SINMOD models conclusions will help in development of the orebearing theory and will form the basis of the creation of new methods of forecasting and estimation of the deposits.