

Structural Model of Ore Deposit Reserve and Its Statistical Description.

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1. A final result of calculation of ore deposit reserve with high level of mutability of useful components distribution (rare and precious metals, gems, etc.) has, as a rule, a considerable mistake. The reason of the mistake is a natural mutability of distribution and statistical conclusions which disregard this mutability.

2. As per a model – entire function of mineral resources prospecting the object models are formed by using prospecting methodology and reserve calculation. In total description its structural diagrams could be considered as a collection W of samples $w \in W$ formed on the base of prior empiric elementarization which is determined by acceptance of conditions of one element “geometry” w of the mutability W . Designing the system “mine field” or its reserve model is made as follows: 1) by specifying additional conditions on the mutability W ; 2) by determining class equivalence W_j on the mutability W ; 3) by developing statistical conclusions regarding this model.

3. Under points 1) and 2) one should understand the formation of fuzzy mutability system W_j (as per property “productivity g ”) on the mutability W with sampling delimitation of this property in sub-mutability $W_j \subset W$. Methods of cluster analysis are used as an instrument of the mutability W structure design. Correctness and optimality of clusterization procedure is determined by calculation value of separation quality function $I(g)$. A conception of existence and segregation of fuzzy mutability groups k on the mutability W determines the description of deposit reserve model by a final set of discrete function distribution $F(x)$ which could be denominated as a final discrete mixture of distribution function $F_x = \sum_{i=1}^N p_i F_i(x)$. The correctness of numerical (statistical)

determination of reserve calculation procedure is provided by values of effective, bias-free, consistent estimations of cluster centroids and clusterization statistic (index of reserve structure τ – which functionally determines ore selection to equivalence classes as per g property).