

Model of Fuzzy Comprehensive Adjudgement (FCA) of Geochemical Data and the Prognosis of Concealed Ores in the Huize Pb-Zn deposit, Yunnan, China*

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The Fuzzy Comprehensive Adjudgement (FCA) model has been built in the expert assisting ore-exploration system in the prognosis of concealed ores in the Huize Pb-Zn deposit, which is a mathematical model designed by using the theory and methods of fuzzy mathematics to comprehensively adjudge weights of several factors and then to evaluate certain occurrence.

The deposit is obviously controlled by strata, structures and rock properties. They have been selected as the fuzzy evaluation factor set, thus to build a FCA model with software realization through the computer programming. So with the geochemical data processed by the FCA prognosis model, the results may pictorially reflect anomalies of mineralizing element associations and are important flags for ore exploration.

The test data of some tectono-geochemical samples from 1631 meters level have been done with the FCA model. Based on several adjudging experiments, the predictive effect appears best when the weight values (score₂, strata, fault) respectively are (0.4, 0.1, 0.5), and the fuzzy comprehensive matrix (CA) has been obtained to draw the figures of the comparative sketch of prognostic anomalies and practical ore-bodies and the 3-dimensional sketch of prognostic abnormality at deep-seated 1631 meters level. The prognosis of concealed ores has been done. The results show that the multi-factor-controlling mineralization anomaly is in accord with what the drills revealed, and using FCA model to identify ore-exploration targets is believable.

Conclusions are as following: ①With complexity of the ore-forming process, it's valuable that it integrate every kinds of favorable geological factors with the theory of fuzzy mathematics. ②Combining some software like STATISTICS, MAPGIS, and MORPAS to process the tectono-geochemical figures and data is one of effective methods. ③ Better ore-exploration effects may be achieved by combining the fuzzy comprehensive anomaly maps with the experts' experience.

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