عنوان مقاله:

A Stochastic Model Upgrading Gold Content in Cyanide Leaching using Monte Carlo Simulation

نویسندگان:

M. Kamran - *Department of Mining Engineering, Bandung Institute of Technology, Indonesia*

Sh. Bacha - *School of Mines China University of Mining and Technology, P.R.China*

N. Mohammad - *Department of Mining Engineering, University of Engineering and Technology, Peshawar, Pakistan*

خلاصه مقاله:

This paper elucidates a new idea and concept for exploration of the gold ore deposits. The cyanidation method is traditionally used for gold extraction. However, this method is laborious, time-consuming, costly, and depends upon the availability of the processing units. In this work, an attempt is made in order to update the gold exploration method by the Monte Carlo-based simulation. An excellent approach always requires a high quality of the datasets for a good model. A total of ۴۸ incomplete datasets are collected from the Shoghore district, Chitral area of Khyber, Pakhtunkhwa, Pakistan. The cyanidation leaching test is carried out in order to measure the percentage of the gold ore deposits. In this work, the mean, median, mode, and successive iteration substitute methods are employed in such a way that they can compute the datasets with missing attributes. The multiple regression analysis is used to find a correlation between the potential of hydrogen ion concentration (pH), solid content (in %), NaCN concentration (in ppm), leaching time (in Hr), particle size (in μm), and measured percentage of gold recovery (in %). Moreover, the normal Archimedes and exponential distributions are employed in order to forecast the uncertainty in the measured gold ore deposits. The performance of the model reveals that the Monte Carlo approach is more authentic for the probability estimation of gold ore recovery. The sensitivity analysis reveals that pH is the most influential parameter in the estimation of the gold ore deposits. This stochastic approach can be considered as a foundation to foretell the probabilistic exploration of the new gold deposits.

کلمات کلیدی:

Cyanidation process, Exploration, Gold, Monte Carlo Simulation, Sensitivity Analysis

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