

The Trend and Development of Geological Prospecting and Exploration Technology for Gold Deposits

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Abstract: With the rapid development of China's social economy, the demand for gold ore consumption is increasing day by day. Under this condition, it is necessary to study the key techniques of gold ore prospecting and geological exploration and carry out geological exploration smoothly. This is to further improve the efficiency of gold ore exploration in China. In practice, Chinese government workers should carefully observe the scientific and technological development of gold prospecting because of the social reality, and scientifically and reasonably choose the prospecting and technical means according to the actual requirements of social geology. It is to discover more gold resources and provide a guarantee for social and economic development.

Keywords: Gold prospecting, Exploration technology, Development trends.

1. Introduction

With the development of the social economy, the demand for gold consumption is getting higher and higher. It is necessary to strengthen the research of gold geological prospecting and exploration in order to successfully carry out gold exploration projects and improve the benefits of gold exploration. Relevant personnel must adjust measures to local conditions, pay close attention to the latest development in gold prospecting technology, and make a reasonable selection of prospecting tools and exploration methods according to local geological conditions. It is to find the best quality gold mine and devote more energy to the development of the national economy.

2. Analysis of Characteristics of Gold Deposits

The gold resources in China are mainly rock gold, which accounts for more than 60%. For example, Shandong Province has the highest gold content, and rock gold forms account for about one-fifth. Gansu Province is the second one on the list. Alluvial gold is also a very important resource. In the whole gold mine, alluvial gold accounts for more than 10% while northeast China accounts for one-third. And, Sichuan Province is secondary. The content of associated gold is also very high, about twice that of placer gold, among which Jiangxi Province has the largest reserves of associated gold. The scale of the mine is directly proportional to the mining cost, that is, the larger mine, the higher the mining cost. The gold mines in China are widely distributed but most of them are small and medium-sized gold mines. Large and super-large gold mines are mainly concentrated in Shandong Province. Small and medium-sized gold mines in Shandong province account for 70% of the country's total and large gold mines account for 70% of the country's total. Moreover, the gold mines of a certain scale account for 10%. At present, most gold mines are underground, and only a few can be mined on the ground, which greatly increases the difficulty and cost of mining. It is difficult to mine gold because natural gold contains a lot of toxic components. All these impurities

have to be extracted and removed in order to improve the purity of gold but the cost is higher.

3. The Geological Background Analysis of Gold Deposits

3.1. Geological Structure and Geological Environment

The gold deposits in China, especially the geological structure of gold deposits, are quite complicated, which is different from the development of other metal fields. Different resource data are recorded according to different development areas. Taking the mineral development and utilization of Xiekeng Copper-Gold Mine as an example, the geological structure of this area is mainly located in the Xikang Indosinian fold area and there are many carbonate rocks and pyroclastic rocks scattered on the surface of the mineral area. Therefore, most of the ore bodies exist between marble rocks and sand schists in the Permian Daguanshan Group, which makes it difficult to explore and develop the mining industry. A reasonable development plan must be put forward according to the specific situation of heavy punishment and exercise.

3.2. Ore Types and Composition

Gold resources in China mainly include three basic categories: chalcopyrite, arsenopyrite, and magnetite. The combination of these three forms has formed the main mineral composition of China's gold resources. From the surface of the soil to the place where chalcopyrite is abundant, the rock structure is mostly granular or metamorphic, and the fracture also has a colloidal structure. At the same time, malachite and azurite are also the most important types of gold mineral resources in China's agricultural production process because the gold geology with complex low-level structure in many areas is rich in 0.5 life span. Therefore, we must pay special attention to the exploration and development of gold mineral resources in our country.

3.3. Relationship Between Wall Rock Alteration and Mineralization

Due to the geological natural environment, the formation process of general ore resources is also relatively complex, especially the change of pH in the rock layer has a considerable effect on the rock formation. Under normal conditions, ore bodies mainly occur in lithification and strong wall rock alteration and are mainly distributed in the contact zone with granite and marble, resulting in a considerable amount of impurity metal ore sources. Therefore, the research on the alteration of the surrounding rock has a very crucial significance and function. The actual conditions of Yancheng must be measured and studied in the prospecting and mineral surveying activities for the mineral resources in various regions.

4. Present Situation of Exploration Work in Gold Prospecting

4.1. Problems in Geological Exploration Technology

Nowadays, the prospecting work of important mineral resources at home and abroad is generally carried out by the technology of three anomalies interaction. Moreover, this technology is frequently used in many old mines in China, and it has also had a positive impact on the progress of geological prospecting in China. However, there are still a series of technical problems such as delineating the chemical anomalies in geological exploration by electromagnetic methods in the actual operation, but it is impossible to accurately judge the delineating depth. Therefore, people are required to better optimize and innovate technology. The chemical anomaly of buried metal can be accurately determined in the actual exploration by using the chemical exploration technology of deep penetration into the earth, but the overall level of this technology is not yet mature enough to effectively determine the actual position of metal blocks.

4.2. Insufficient Knowledge of Gold Exploration Risks

Through a large number of practical studies, people have found that they often face a series of problems and difficulties when carrying out gold prospecting projects. Once they can not be effectively solved, it will inevitably affect the overall quality and benefit of the whole mining project, and will also have a corresponding impact on the steady development of gold development in China. At present, the field of corporate capital is also facing great difficulties. Due to the lack of basic knowledge and understanding in this field in all sectors of society, it is impossible to fundamentally study and solve the problem according to the actual situation of enterprise funds shortage. With the comprehensive reform of the national mineral resources market mechanism and the increasing market competition, gold exploration projects often do not have enough funds to ensure the implementation of the projects. Through the analysis of the actual survey data, it is concluded that the project vacuum phenomenon is very serious. Many gold exploration enterprises have a series of defects in organizational structures, and their management level is relatively low, which will also have many influences on the development of prospecting and exploration projects.

5. Countermeasures of Gold Prospecting and Exploration Technology

5.1. Introduction of Cutting-edge Modern Exploration Technology

In gold prospecting and exploration projects, we must constantly promote exploration innovation and implement the project by using advanced modern exploration methods in order to enhance the effectiveness of the project. Compared with general exploration methods, the advantages are more obvious, which can significantly improve the quality and efficiency of gold prospecting and exploration. Therefore, it is necessary to study and think about gold prospecting and exploration methods as a whole, grasp the characteristics of rock physical properties, and explore the metallogenic regularity. This is to apply advanced exploration methods to them, improve the drawbacks and shortcomings of conventional methods, enhance the gold prospecting efficiency and product quality, and provide a guarantee for future gold development.

5.2. Optimize the Organization of Exploration Work

In order to effectively improve the efficiency and quality of gold exploration, the adjustment and optimization of exploration projects must be promoted according to site conditions. Building a complete financing channel for gold exploration and spreading it through the multimedia platform is essential. Understanding exploration projects extensively can easily solve financing problems. They should promote the reform of the mineral resources management system, avoid the occurrence of project vacuum, and ensure the smooth implementation of gold prospecting and exploration. Finally, they can strengthen the overall ability of exploration institutions, promote the innovation of exploration techniques and methods, form a high-level talent team structure, and lay a solid foundation and guarantee for the smooth progress of gold prospecting and exploration projects in the future. According to the needs of social and economic benefits, they should do overall research and consideration, look for corrective measures to check on the basis of resources, try to avoid illegal acts, and effectively improve the efficiency of gold prospecting and exploration projects.

6. Trends and Development Prospects of Geological Prospecting and Exploration Techniques for Gold Deposits

6.1. Geological Exploration Technology

Geological exploration technology is an important prospecting technical means in gold prospecting geological exploration projects, and it has extensive advantages. According to the actual situation of gold production, heavy sand prospecting technology, geological mapping mineral survey technology, and its mineral prospecting technology can be applied to the research of geological exploration. Among them, geological mapping technology is widely used in geological exploration because of its completeness.

6.2. Geophysical Prospecting Method

The scheme mainly uses a series of geological instruments and equipment scientifically during the survey, fully receives the physical phenomena within the scope of work, and selects the necessary connotation from the obtained data by selecting an appropriate mineral survey processing method. After that, the geology is reasonably investigated and studied through the natural physical characteristics of geological ore body changes. The location, form, and scope of mineral storage are reasonably speculated according to certain geological theoretical knowledge and experience. To sum up, the basic conditions such as physiognomy, physical properties, and scale of the mineral structure are the cornerstones of geological physical investigation, which are helpful to geological research. Specifically, it can be classified into the electrical method, magnetic method, etc., which have completely different working principles and application scopes for different types of survey methods.

6.3. Chemical Exploration and Exploration Technology

It is the basic theory that makes geochemistry and mining science become the application of modern industry and makes a more scientific and comprehensive study of the geochemical dispersion halo phenomenon. The distribution law of chemical elements in the extracted mantle will also be applied to improve the implementation quality and level of mineral prospecting projects. Experiments show that the application of this gold prospecting method can also improve the level of oil and gas resources and nonmetallic mineral prospecting projects in China.

6.4. Application of GPS Induction System

This technology also applies the method of satellite navigation and provides accurate three-dimensional digital coordinates for gold prospecting and other exploration work. It can be found that the quality and scientific degree of sensor technology can be improved to the maximum extent by establishing a systematic system in the prospecting and prospecting engineering of gold mines. The system construction is the integration of a GPS system, conversion analysis system, and information tracking and processing system, thus it improves the scientific reliability of the GPS sensing system.

6.5. Follow the Corresponding Procedures.

When applying the gold geological prospecting and exploration methods, it is necessary to scientifically determine the geological structure, scientifically judge the regional structural state, and find out the key points of different geological structures. This is to grasp the geological

structure more correctly and develop mineral resources effectively. Then, we must correctly understand the mineralization within a certain range, study the fault structure, scientifically analyze the intrusion degree of magma, and further study the formation of minerals in various rock formations, so as to correctly judge the deposits. Finally, it is necessary to correctly analyze the exploration results. In the later stage of implementation, it is necessary to correctly sort out and utilize the geological exploration survey data, scientifically analyze the exploration scope, correctly judge the depth, thickness and structural form of the orebody, correctly infer the size, shape and characteristics of the orebody, and further collect the geological exploration survey data.

7. Conclusion

To sum up, the application of satellite navigation technology in the scientific and geological research of gold prospecting technology provides an accurate three-dimensional digital coordinate system for gold prospecting technology. Meanwhile, a large number of scientific geological instruments and equipment are used to explore and collect all physical phenomena in the world. Then, meaningful gold prospecting information can be screened from the collected data by using the corresponding prospecting methods. The practice has proved that gold geological prospecting and exploration information has the significance of popularization and application. To give full play to the functions of information technology, we must do a good job of controlling the efficiency of information technology.

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