

## ORES AND MINERALS OF GOLD AND SILVER. PREPARE THEM FOR RECYCLING

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### Abstract

This article deals with ores and minerals of rare metals, especially gold and silver. Through this information, you can learn about ore and minerals and the process of preparing them for processing. Various beneficiation, hydrometallurgical and pyrometallurgical methods are used to extract gold and other precious metals from gold ores.

**Keywords:** endogenous, exogenous, mineral, ore, scattered deposits, sulphide ores, copper ores, carbonaceous ores, gold and silver ores, main machines, mills, screening of large lumps.

### Introduction

The unique physical and chemical properties of rare metals lead to their widespread use in many fields of science and technology. The main function of rare metals is determined due to their high price, which is related to their influence on the internal and external economy of the state. The direction of metallurgy of rare metals is a very complex field, which requires an expert who has acquired it not only to separate gold and silver from primary raw materials, but also to separate them from secondary raw materials, to have a deep knowledge of enrichment processes, hydrometallurgy, and pyrometallurgy processes.

Along with gold, silver, copper and pure iron, it has been known to mankind since ancient times as the first metal. This metal, which attracted people's attention with its attractiveness and luster, was mined in 8000-12000 BC. Already at that time, gold was used in the production of jewelry, ornaments and other household appliances.

Gold has been known in Uzbekistan since ancient times, and it is found in many places. Gold in the Chotkal-Kurama Mountains, Kyzylkum, Western and Southern Uzbekistan has been observed by many scientists and detailed information has been provided. Gold is the primary currency metal. It is used in decorative works, making ornaments, physical and chemical instruments, medicine and other fields.

"Almaliq KMK" and "Navoiy KMK" are the leading gold producing organizations in our country.

Currently, it is difficult to say how much gold there is in Uzbekistan, but it is estimated to be hundreds of tons. Prospecting and gold mining are still going on.

It is planned to increase the rate of gold mining and precious metal production in the near future. For these purposes, measures for the further development of the mining metallurgy sector have been approved.

Gold deposits in the Urol mountain range belong to the Carboniferous period. There are large deposits of gold, copper, lead, spirit, tungsten, molybdenum, and uranium that are currently being mined in the Republic of Uzbekistan. Condensed additional elements found in deposits and meeting industrial requirements: germanium, rhenium, yttrium, ytterbium, tantalum-niobates, selenium and iron, indium, scandium, etc., were formed as a result of magmatism processes of the Carboniferous geological period.

Most of the gold (94-96%) is mined from ores, and 2.5-3% is mined by satellite method during extraction of other non-ferrous metals. However, in Canada and the USA, which are the leading capitalist countries, this indicator is 25-30%.

In science and industry, gold (jewelry) is used as an alloy-metal in jewelry, dental prostheses, in medicine, space laboratory and station devices, and in fire and acid-resistant equipment. Silver is used in industry as catalysts, silver plating, and domestically in the preparation of tableware. Water stored in silver containers will not rot for a long time. The most sensitive, refractory of platinum and platinoids is used in the preparation of equipment and laboratory equipment.

Gold deposits are divided into vein and scattered deposits. Vein deposits are divided into endogenous and exogenous deposits. These deposits are different from others due to the variety of minerals in their ore composition. According to their origin, they belong to the hydrothermal class.

Exogenous gold deposits consist of copper deposits and semimetallic mineral deposits. These zones are covered with oxide iron compounds called "iron cap" and they are rich in root gold ores and important in industry. Such ores are processed in the Urals and Kazakhstan.

Sulfide ores consist of layers and small veins. The amount of gold ore found in the form of fine particles does not exceed 1-2 g/t. Gold is extracted from these ores during the processing of zinc ores by satellite method. Sulfide gold ores are divided into the following groups: gold-pyrite, gold-arsenic, gold-copper, gold-antimony, gold-uranium and gold semi-metallic ores. Large pieces of gold are easily separated from the ore minerals as a result of the grinding process and are easily retained during gravity enrichment, but they are poorly flotation and slowly dissolve in cyanide solutions. Fine gold is rarely found in pure form in the process of mining, it is partly combined with other minerals. Fine native gold flotation is good, it dissolves quickly in cyan solutions, but it is poorly separated by gravity. Fine-grained gold - in most cases, it is bound with sulphide minerals, and a small amount of surface is exposed as a result of melting.

Silver, like gold, is found in nature in the form of pure, native silver metal. But unlike gold, silver forms chemical compounds and forms minerals. It forms sulfur compounds and takes

part in sulphide ores, or it is contained as fine dispersed particles. The surface of silver is covered with oxygen film and oxide film to a certain extent.

In most modern gold mining factories, the grinding process is carried out in two or three stages. The ores from the mines are large (from 500mm to 1500mm), first they need to be crushed and crushed to expose the gold surface.

Various beneficiation, hydrometallurgical and pyrometallurgical methods are used to extract gold and other precious metals from gold ores: sorting, gravity beneficiation, flotation, amalgamation, cyanide, smelting. In most cases, these processes are combined with each other in a combined scheme. The selection of the beneficiation method depends on the size and mineralogical composition of the ore pieces. Preparation processes for enrichment are as follows: crushing, grinding, classification, boiling, burning.

Since hydrometallurgy is the main process for extracting gold and silver from most ores, the degree of crushing should ensure good exposure of gold and silver minerals to solutions. In order to determine the stages of crushing of ores, they are first studied under experimental conditions. If the gold ore is in a soft state, it should be crushed as fine. If the ore contains gold in large form, the grinding process is also carried out in a large form (0.4 mm 90%). Most ores contain fine gold along with large gold, and such ores are crushed very fine (0.074 mm).

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