

Biosorption of antimony, mercury and gold at complex conversion of intractable ores

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With a purpose of new microorganisms extraction, that sorb metals, there was carried out microbiological examination of ore, received from this ore concentrates and tails of the lower horizons of Dzhizhikrut deposit. For microorganisms extraction (bacteria, microscopic fungi and actinomycetes) following mediums were used: beef-extract agar (BEA), agarized Ashby medium, Czapek's medium (agarized) and starch-ammonium medium. The method of limiting dilutions was used for quantifying microorganisms. We prepared a suspension of the samples in water, 10 grams of the sample was shaken with 90 ml of sterile water for 5 minutes.

There were taken following samples:

- 1 - Ore initial Sb-3.8%, Hg-0, 4%, Au-2.5g / t;
- 2 - Concentrate: 51.5% Sb, 4.1% Hg, Au-6.8g / t,
- 3-Tails: 0.2% Sb, $\geq 0.02\%$ Hg, 1.6g / t Au.

Among them are found bacteria of the genera Bacillus, Mycobacterium, Azotobacter, Pseudomonas and others. Revealed heterotrophic denitrifying bacteria. Dominated among microscopic fungi the genera of Penicillium, Aspergillus, Chaetomium, Fuzarium. Actinomycetes were mostly representatives of the genus of Streptomyces. 3 strains of microscopic fungi and 2 strains of actinomycetes were cleaned in a pure culture. Determination of microscopic fungi allowed us to refer them to Aspergillus niger, Aspergillus terreus, Aspergillus fumigatus, and actinomycetes to the genus Streptomyces. These 5 strains were later used in the antimony and mercury biosorption. For the biosorption of antimony and mercury, it was necessary to grow these cultures of microorganisms to produce biomass.

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