TREATING LIQUID WASTES FROM HYDROMETALLURGICAL PROCESSING OF GOLD CONCENTRATES

Description
The suggested treatment technology includes volatilization and absorption of cyanic hydrogen and oxidation of the residual impurities:
- acidification of spillage hydrometallurgical solutions by sulphuric acid;
- HCN volatilisation in inclined rotor machines (IRM);
- cyanic hydrogen absorption with alkali solution in jet scrubbers or IRM;
- separation of heavy metals precipitated from acidified solution (AVR process Acidification – Volatilisation – Reneutralisation).

Extraction of cyanides as HCN and heavy metals as precipitates of complex compounds is followed by post-treatment of waste waters by oxidising attack with calcium hypochlorite or hydrogen peroxide.

Technical appraisal and economic benefits
Waste waters from hydrometallurgical gold ore processing are commonly neutralised through oxidation by active chlorine reagents. However, this approach is associated with high salt content and oxidant consumption, risk of incomplete decomposition of complex cyanides, impossibility to extract valuable components, etc.

The suggested technology combines regeneration and destruction methods to (i) achieve volatilisation, cyanic hydrogen absorption, and oxidising of the residual impurities and (ii) provide the recycling of purified water and cyanides in the form of alkali solution NaCN; neutralisation is possible with a considerably reduced oxidant consumption (in half).

Application areas
Decontamination of liquid phase from cyanidation tailings at gold mining and processing enterprises.

Development stage
The technology of liquid phase treatment (spillage solutions) from the tailing dump was tested in 2002 at the Kholba mine (East Sayans, Bouryatia, enterprise “Buryatzoloto”).

Patent situation

Commercial offers
Joint commercialisation.

Estimated cost
Under the contract.

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