ABSTRACT

Bulk flotation and scavenging of a chalcopyrite-bearing copper ore containing nickel and cobalt sulfides and differential flotation of the bulk float with variations of reagent regimes and operating parameters have been carried out to :

(i) improve upon the overall recovery of nickel and cobalt sulfides in the bulk concentrate and

(ii) depress the nickel and cobalt values from the bulk concentrate.

For the evaluation of the test results, an index of *flotation efficiency* has been defined.

Empirical correlations have been proposed for recovery and flotation efficiency for metal values in bulk flotation of the ore.

A process of selective flocculation followed by differential flotation has been developed for a near total depression of nickel sulfides along with a considerable proportion of cobalt. A process flowsheet for such a separation is also proposed.

The mechanism of selective flocculation of the sulfide minerals present in the bulk concentrate and depression of the nickel and cobalt rich fractions have been explained through rate equations.

Key Words : activator, bulk flotation, collectors, copper ores, cobalt, correlations, chalcopyrite, frothers, flotation, differential flotation, nickel, selective flocculation, sulfides, rate equation reagents and pH regulators.