

Synergetic effect of the Sodium Hydrosulfide and Ammonium Sulfate as Activators in the Flotation of Copper-cobalt Bearing Oxide Minerals from the Kamoya Mineralization in the Democratic Republic of Congo (DRC).

Authors : Craig Nsakabwe Kabange

Abstract : The current study investigated the synergetic effect of two activators, mainly sodium hydrosulfide (NaHS) and ammonium sulfate $(\text{NH}_4)_2\text{SO}_4$, as sulphidizers in the flotation of oxide minerals. A series of flotation tests were conducted on copper-cobalt samples originating from the Kamoya open pit in the DRC at an adjusted pH value of 9.5. The results revealed that in the presence of NaHS (5000g/t), an increase in the recovery values of both metals to a maximum of 87% copper and 78.1% cobalt could be achieved. However, the addition of $(\text{NH}_4)_2\text{SO}_4$ to the NaHS-containing pulp had a negative effect on the recoveries, shifting it from 87 to 49.1% for copper and from 78.1 to 49.2% for cobalt. The recovery trend for the two metals was kept below 50% with an increase in the concentration of $(\text{NH}_4)_2\text{SO}_4$. A satisfactory result was obtained at a NaHS - $(\text{NH}_4)_2\text{SO}_4$ concentration ratio of 1/1, which delivered 89.5 % Cu recovery and 79.2% Co recovery.

Keywords : ammonium sulphate, sodium hydrosulphide, sulphidizer, activator

Conference Title : ICMMPME 2023 : International Conference on Mining, Mineral Processing and Metallurgical Engineering

Conference Location : Montreal, Canada

Conference Dates : May 15-16, 2023