Copper-Cobalt ores

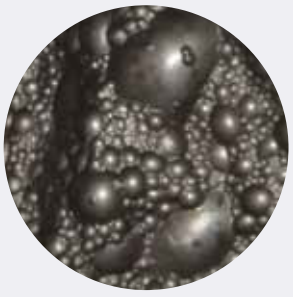
Various cobalt bearing minerals have economic significance including cobaltite (CoAsS). carrollite ($Cu(Co.Ni)_2S_4$), and linnaeite (Co_3S_4). These are often associated with copper minerals and pyrite and pyrrhotite iron sulphides. Two different flotation separation strategies are used.

Differential flotation sequence: A differential copper-cobalt flotation separation which begins with selective copper flotation by raising the slurry pH to 10 with lime and using a dithiophosphate copper collector. The tails produced in the first differential flotation step is followed by a pyrite and pyrrhotite flotation stage using xanthate and MBT, leaving the cobalt minerals in the flotation cell tails.

The cobalt minerals are then floated by using sulphuric acid to decrease the pulp pH to 4. Sodium sulphide is conditioned in the pulp. Cobalt is floated using a combination of xanthate and dithiophosphate and/or MBT. Depending on the cobalt mineralization, use of an activator such as copper sulphate could provide improved metallurgy when floating with a combination of xanthate and dithiophosphate at a pH 8-9.

Bulk flotation sequence: Under the bulk flotation process, a bulk Cu-Co flotation concentrate is produced at natural pH with xanthate, dithiophosphate and/or MBT, particularly if the copper mineralization is chalcocite. Copper is separated from the cobalt in the bulk concentrate by raising the pH up to at least 11 which depresses the cobalt minerals. Cobalt depression can be enhanced by small cyanide dosages.

If the cobalt is found with chalcopyrite, bulk flotation can be carried out with xanthate at pH 10, and separation made at pH 4 with an amine and combinations of fatty acid to recover the cobalt minerals.



The following Danafloat™ collectors should be considered initially copper-cobalt flotation:

Selective Cu Float:

Danafloat™ 123
Danafloat™ 233
Danafloat™ 245
Danafloat™ 468
Danafloat™ 507E
Danafloat™ 871

Selective Co Float:

Danafloat™ 067
Danafloat™ 068
Danafloat™ 070

Bulk Cu-Co Float:

Danafloat™ 245

CHEMINOVA DANAFLOAT™