



High performance

Flotation collectors

for optimal solutions


CHEMINOVA
DANAFLOAT™



Froth Flotation

Froth flotation is clearly the dominant mineral concentration method for nearly all mineral types such as, but not a complete list, copper, molybdenum, gold-silver, nickel, lead, zinc, phosphate, industrial minerals and potash ores. Also amenable to flotation are fine coal and other minerals such as fluorspar, glass sand, barite, pyrite, talc, and iron oxide. In theory, flotation can be employed for the separation of any slurry containing particles that are sufficiently liberated. Particles ranging in size from 0.5 mm down to a few microns are responsive to flotation.

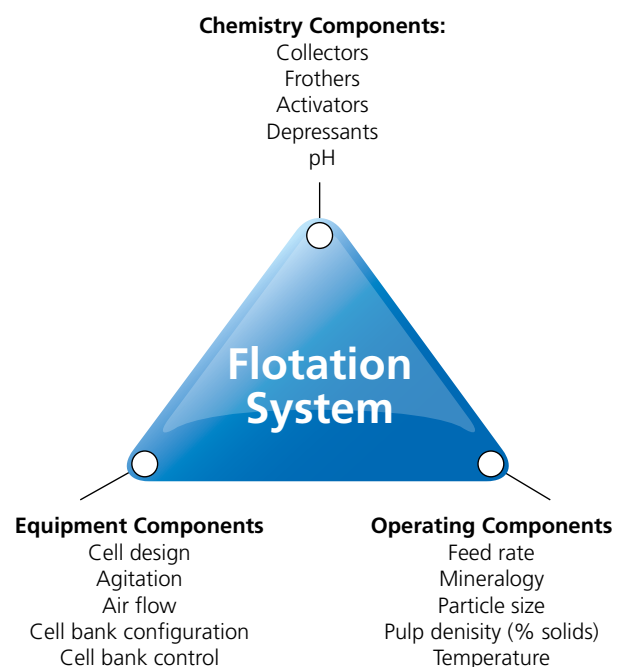
The flotation process encompasses a series of very broad steps:

- Ore size reduction to achieve target mineral value liberation and adequate particle size for flotation.
- Making particle surface chemistry and flotation bubble hydrodynamic conditions favourable for the adherence of the desired minerals to rising air bubbles in the flotation cell.
- Allowing a froth layer containing the captured target minerals on the flotation cell surface.
- The froth upgrades as the bubbles rise through the froth bed, the undesirable and insufficiently liberated particles drain back to the flotation cell slurry.
- Removing the upgraded froth.

Application

Despite over a century of research and technological advances, flotation is still in many respects considered an “art” rather than science. Much science and technology is applied to defining the flotation mechanisms and conditions needed to effect separations. And modelling has significantly enhanced system predictive abilities, particularly the rate of flotation (kinetics). Considerable application experience that provides guiding principles in the selection and use of flotation reagents is nonetheless required.

Reagent selection, chemical suite combinations and flowsheet design must be tailored to each specific ore. There are a myriad number of interdependent variables that impact flotation, which are beyond the predictive capabilities of science. Empirical work is the basis for any flotation development and optimization work and application of statistical tools are necessary. The process variables include identity of the value and the gangue minerals, their relative amounts, degrees of liberation, particle sizes and factors, which affect the overall economic viability of the operation (capital and operating costs, feed grade, concentrate grade, extent of grinding, etc.).



Danafloat™ collectors

Cheminova manufactures a broad range of dithiophosphate collectors very efficient on sulphide ores and applicable for a broad variety of minerals.

The dithiophosphate collectors help enhancing selectivity and recovery of the different minerals, which can be further optimized by blending the different dithiophosphates with or without addition of NaMBT and/or thionocarbamates.

Cheminova manufactures the dithiophosphate collectors from the base elements yellow phosphorus and sulphur. This ensures that the process is backward integrated. The process gives the Danafloat™ products a high level of batch to batch consistency as Cheminova have full control of the production and the purity profile.

Cheminova field and laboratory technical services personnel support customer design of a flotation reagent suite needed to maximize mineral recovery for each process circuit. Cheminova's Danafloat™ high quality reagent line is extensive and provides the necessary tools to achieve flotation objectives. Danafloat™ reagent blends are supplied because for some ores these provide a positive synergistic effect. The Danafloat™ collectors in combination with other reagents, such as Xanthates, often enhance mineral recovery and/or improve flotation kinetics.

From a process engineering standpoint, collectors may be used to either maximize high value mineral recoveries or high grade concentrates. Typically initial flotation stages focus on recovery maximization, which also provides the benefit of reducing concentrate tonnage and smaller process sizes. Subsequent flotation steps then focus on upgrading this intermediate concentrate product to saleable concentrate grade. Separate collectors may be used in each flotation step to effect the separations desired and needed depending on the strategy for that stage, such as roughing, scavenging and cleaning.





Cheminova

Cheminova was established in Copenhagen in 1938 by Mr. Gunnar Andreasen, a chemical engineer. The company has grown to become an important manufacturer of plant protection chemicals, chemical intermediates, and flotation chemicals.

In 1944 Mr. Andreasen donated the entire capital of Cheminova to the independent and esteemed Aarhus University Research Foundation to secure the autonomy and future of the company. For our customers, the corporate structure of Cheminova is another guarantee of our position as an independent and reliable, long-term supplier.

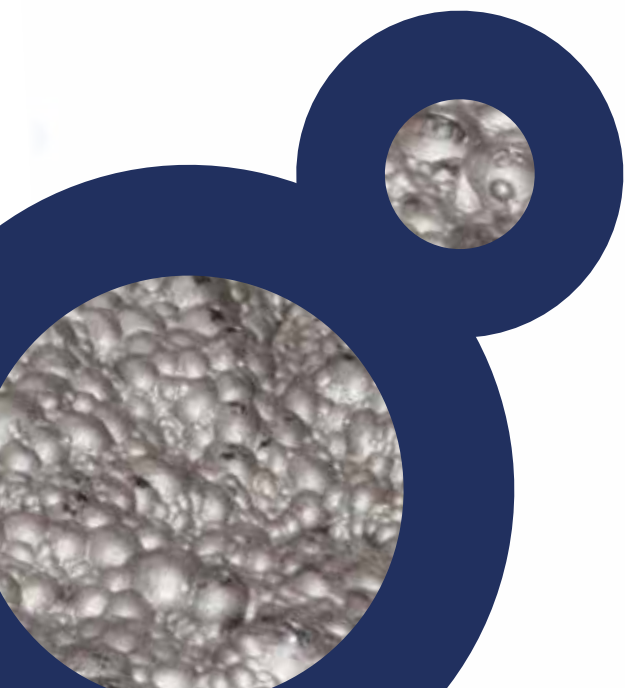
In 1986 Chemiva was listed on the Copenhagen stock exchange.

Cheminova has become a well-established leader in the production of organophosphate reagents and chemicals with the portfolio now including:

- Mineral flotation reagents
- Insecticides
- Herbicides
- Fungicides
- Intermediates

Our Danafloat™ products are used world-wide as premium collectors for optimized performance.

For more information, please visit www.danafloat.com and www.cheminova.com.



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