

file

FILE COPY

O T T A W A

November 13th, 1944.

R E P O R T

of the

ORE DRESSING AND METALLURGICAL LABORATORIES.

Investigation No. 1743.

Flotation Reagents from the Onyx Oil and
Chemical Company Limited, Montreal, Quebec.

=====

(Copy No. 14)

O T T A W A

November 13th, 1944.

R E P O R T

of the

ORE DRESSING AND METALLURGICAL LABORATORIES.

Investigation No. 1743.

Flotation Reagents from the Onyx Oil and
Chemical Company Limited, Montreal, Quebec.

Shipment:

One box (weight, 15 pounds) containing samples of ten different flotation reagents was received on October 19th, 1944. This shipment was forwarded by Mr. L. A. Breault, of the Onyx Oil and Chemical Company Limited, Dominion Square Building, Montreal, Quebec. The reagents were manufactured at the company's plant at St. Johns, Quebec.

Purpose of Investigation:

To determine, by preliminary examination and collaborative tests, the adaptability of the different reagents for use in flotation concentration.

Investigative Work:

A portion of the reagent under examination was added to distilled water, with a pH of 7.2, and the solubility in this medium was noted. A definite quantity of the reagent was then mixed with distilled water and the amount of frothing potential determined by means of the Ensell frothmeter. The collecting power of the reagent was then tentatively indicated by chemical procedure. Finally, a portion of pure mineral, along with the reagent to be tested, was subjected to flotation concentration in a 50-gram Denver flotation cell and the resultant concentrate or lack of concentration was noted. The following minerals were tested by this procedure: quartz, fluorite, barite, apatite, brucite, calcite, feldspar, and salt.

The amount of frothing, as recorded by the Ensell machine, runs from 0 to 100. These figures are comparative and indicate a range from no frothing power (0) to complete frothing potential (100).

The chemical composition of the different reagents was supplied by the manufacturer.

Results of Investigative Work:

Xynoflow S-50%. - A water solution of the salts of fatty acid amino amide. This reagent was in the form of a yellow paste and on the addition of distilled water formed a murky grey solution. The frothing potential was 80 and gave a wet, rather fragile bubble. No apparent collective power was shown from the flotation tests on the different minerals used.

Xynoflow V-50%. - In the work on this reagent, the results obtained were similar to those shown on S-50%.

Onyx B.T.C. 10%. - A 50 per cent solution of high molecular alkyl dimethyl benzyl ammonium chloride. This

(Results of Investigative Work, cont'd) -

reagent was in the form of a yellow liquid and formed a clear solution when mixed with distilled water. The frothing potential was 80, and gave a rather wet froth which broke easily. Good results were obtained from the flotation of quartz in the 50-gram cell; this reagent showed superior collective power for this mineral, and a good recovery in a suitable froth was secured.

Ammonyx T-25%. - A mixture of higher alkyl dimethyl benzyl ammonium chlorides in water. This is an undistilled grade of Onyx B.T.C. 10% and the alkyl radicals range from C₁₄ to C₁₈. This reagent was a yellow liquid which was soluble as a clear solution in distilled water. The frothing potential was 40, giving a fairly stable wet froth. This reagent showed some collective power with quartz, but the recovery was low and the froth did not break down sufficiently to enable it to be handled readily.

Ammonyx AO-20%. - A solution of amine oxide in water. A yellow liquid, soluble to a clear solution in distilled water. The frothing potential was 30, giving a wet froth breaking fairly easily. No apparent collective power was shown in the attempted flotations of the different minerals used.

Cetyl Trimethyl and Cetyl Dimethyl Ethyl Ammonium Bromide. - Quaternary chemicals. They come in the form of white powders which are soluble to clear solution in distilled water. The frothing potentials were both at 80 and showed voluminous, stable, small-bubbled froths. These reagents showed some collecting power for quartz in the flotation tests but the resultant froths were too voluminous and did not break readily.

Ammonyx Q-75%. - An iso-propyl alcohol solution of technical dimethyl ethyl 9 octa-decenyl ammonium bromide. A

(Results of Investigative Work, cont'd) -

brownish coloured liquid paste soluble in distilled water to a clear solution. The frothing potential was 85.

PF 278 and PF 280. - These are tertiary amine compounds which are derived from coconut and oleic fatty acids. They come in the form of yellow-brown liquids and are insoluble in water. On the addition of 2 per cent HCl to the mixture, the reagents form emulsions and were tested in that form. The froth potentials were 80 and 65, and the froths were fairly stiff and voluminous.

...

As recommended in Mr. Breault's letter of October 27th, 1944, Ammonyx Q-75, PF 278 and PF 280 were tested for use in salt purification by flotation. The salt used was a composite sample from the Malagash salt mine at Malagash, Nova Scotia. The flotation was performed using the standard methods in vogue at the pilot plant at Malagash. By these methods the flotation products which were obtained assayed slightly over 99 per cent NaCl in each case. The recovery was highest from Ammonyx Q-75 and this reagent appears, from the results obtained by this small-scale test, to be suitable for salt purification by flotation.

Summary and Conclusions:

The results obtained from the test work on the different reagents show that Onyx B.T.C. 10% has good possibilities for use in the flotation of quartz or siliceous material; and that of the reagents recommended for the purification of salt by flotation, Ammonyx Q-75 gave the best results. The remainder of the reagents all have good frothing power but their value as collectors was not apparent in the investigative work.

oooooooooooo
ooooo
o

HLB:GHB.