

ALIEN PROPERTY CUSTODIAN

PROCESS FOR THE FLOTATION OF NON SULFIDIC CONGLOMERATIONS

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My invention relates to a process for the flotation of non sulfidic conglomerations containing quartz, aluminium oxide and the like, for instance fluor spar, (calciumfluoride) tin stone (tin oxide), feldspar, heavy spar (bariumsulfate) and so on.

Hitherto the flotation of, for instance, fluor spar was carried out with substances such as oleic acid and its esters, pine oil, tar oil, sulfonated fatty acids and the like.

Now it was found by thorough investigations that the flotation of substances as mentioned above will give excellent results if flotation means are used which contain sulfonated, preferably highly sulfonated castor oil as foamer and fatty alcohol sulfonates, especially sulfonated higher fatty alcohols, such as hepta decyl alcohol, cetyl alcohol and/or vegetable oil sulfonates as collectors. It has been proved advantageous to use commercial products, consisting wholly or partly out of higher fatty alcohols such as are used in the textile industry. Instead of or besides sulfonated fatty alcohols, substances which are known as "Igepale" (auxiliary means in the textile industry) may, for instance, also be utilized.

The above mentioned additions, such as fatty alcohol sulfonates and/or vegetable oil sulfonates may either wholly or partly be substituted by soaps, such as for instance, soda soap, potash soaps (soft soaps, oleate soaps and so on) or by pyridine bases, for instance, pure or crude pyridine and its homologues such as picoline, lutidine, further chinaldine and the like. Furthermore, the addition products of ethylene to alkyl tetra hydronaphthol or of ethylene oxide to turpentine wood oil and the like may be used.

According to my invention the above mentioned ingredients, such as fatty alcohol sulfonates, vegetable oil sulfonates soaps, pyridine bases and addition products may be added to the sulfonated castor oil either alone or in combination. The components of the mixture may be utilized in the form of pure or substantially pure products or in the form of less pure commercial products or as raw materials.

Other auxiliary means, such as for instance, wetting agents, emulgators or the like may be added to the sulfonated castor oil or the mixtures containing the sulfonate castor oil.

Sort and quantity of the addition substances depend inter alia on the kind of the conglomeration, ratio of quantity of the substances contained therein, quality of the flotation water and so on. The optimal proportions of mixture will be found easily by some preliminary tests.

The ratio of quantity may be chosen in such a

manner that the mixture contains of about 80-90% of sulfonated castor oil and of about 10-20% additional substances of the above mentioned kinds, either alone or in combination.

The amount of the flotation means depends on the kind of the material to be treated and on the contents of the conglomeration or pulp respectively. In general, quantities of about 0,5-2 kgrs. of the mixture will be utilized per ton conglomeration.

Examples

1. Ground fluor spar is flotated with a mixture, consisting of 8 parts by volume of highly sulfonated castor oil and 2 parts by volume of a fatty alcohol sulfonate, known under the trade mark "Brilliant-Avirol." 1 kg. of the flotation means is used of 1 ton of the conglomeration.

2. Ground heavy spar is flotated with a mixture which consists of about 90% parts by volume sulfonated castor oil and a suitable amount of a known wetting agent with 10 parts by volume of soft soap. About 1,5 kgrs. of the flotation means are used for 1 ton of heavy spar.

According to my invention the use of the flotation means has the advantage that the flotation is carried out quicker and better than with the addition of other known substances, as already mentioned. Equal amounts of chemicals within given times will yield better results of concentrates, for instance, fluor spar concentrates, in comparison with the hitherto known methods. The flotation means according to my invention have also the advantage that they are easily soluble in water and in consequence well to be measured.

If desired, the flotation may be carried out advantageously at elevated temperatures. Thus, the working up of fluor spar may be carried out, for instance, at temperatures of about 30-50° centigrade, whereby the amount of flotation means may be diminished accordingly. With multi step working, for instance, only one step may be done at elevated temperature.

According to my invention a combined table concentration with a flotation may be carried out with advantage. This will be done in such manner that the raw conglomeration mixed with water to form a pulp is then brought into contact with a mixture of flotation means according to my invention, whereupon the pulp treated with the flotation means is subjected to the usual sorting on a table concentrator. This facilitates the separation of grain sizes which otherwise would not be able to be sorted with the usual flotation.

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