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PROCESS FOR THE FLOTATION OF FLUOR SPAR

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My invention relates to a process for the flotation of fluor spar.

For the flotation of fluor spar which in general has the purpose to obtain as clean a concentrate of fluor spar as possible and to remove the natural materials accompanying this mineral such as quartz, heavy spar, sulfides and iron compounds, preferably such substances as oleic acid and its esters, pine oil, sulfonated aliphatic acids, tar oils and the like have been utilised.

Detailed experiments have shown that the flotation of fluor spar can be effected in a particularly good manner by using as flotation agent a mixture of sulfonated aliphatic hydroxy acids with sulfonated higher alcohols.

Sulfonated hydroxy acids of the aliphatic series are, for instance, sulfonated ricinoleic acid or its esters. With advantage such commercial products come into consideration as are used in the textile industry under the trade name "Turkey red oil."

As higher aliphatic alcohols such alcohols as heptadecyl alcohol, cetyl alcohol and the like may be used. Here again the commercial products may be used with advantage, for instance, such which consist in or contain as main constituents higher aliphatic alcohols, especially such, which are utilized in the textile industry. Instead of or in addition to sulfonated aliphatic alcohols substances of, for example, nearly the same chemical and physical structure as the textile auxiliary means, known by the trade-mark "Igepal" may be used.

The mixtures according to my invention are preferably composed in such a manner that they consist mainly in sulfonated hydroxy acids. In general, mixtures which contain about 80 to 99% of sulfonated hydroxy acids and about 1 to 20% of sulfonated aliphatic alcohols may be used with advantage. The composition of the mixture depends to a certain degree on the components of the material to be separated its proportions in quantity and in some cases also upon the properties of the water utilized in the flotation.

In certain cases other proportions in the composition of the mixture may come into consideration. The optimal proportions of the mixture can easily be ascertained by preliminary experiments carried out on a small scale.

The application of the flotation agent according to my invention offers the advantage that the flotation is effected more speedily and more thoroughly than by application of the hitherto known means for carrying out the flotation of fluor spar. By the use of equal amounts of chemicals the working according to my invention may be effected within a limited time with greater yields in fluor spar concentrates than by the hitherto known processes. Furthermore, the flotation agents according to my invention have the advantage that they are readily soluble in water so that they can be uniformly and completely distributed therein and in consequence thereof may also be dosed.

The flotation of fluor spar according to my invention is preferably effected at elevated temperatures such as, for instance, at about 30 to 50° C. The carrying out of the process at elevated temperatures permits in certain cases also a reduction of the quantity of the flotation agent to be applied. With multi step working the process can, if desired, be carried out in such a way that one step or a few steps only are effected at higher temperatures. My invention can also be applied with advantage to a combination of the use of separating tables and flotation. In this case, I proceed, for instance, in such a manner that the raw material mixed with water is stirred with the mixture of the flotation agents according to my invention and the aqueous mixture treated with the flotation agent is subjected subsequently in the ordinary way to the separation on the separating table. In this way it is possible to obtain a perfect separation even of such grain sizes which can not be treated by means of the generally used flotation agents.

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