Patented Aug. 26, 1924. 1,506,385

UNITED STATES PATENT OFFICE.

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PROCESS OF MAKING FLOTATION OIL.

No Drawing. Application filed December 2, 1918. Serial No. 264,983.

To all whom it may concern:

Be it known that I, FREDERICK H. RHODES, a citizen of the United States, residing at 225 E. Mt. Pleasant Ave., Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Processes of Making Flotation Oil, of which the following is a specification.

This invention relates to a new oil and the process of producing the same. It relates more specifically to the production of a coal tar oil which is free from pyridine bases and which is adapted for use as a flotation oil for ore separation.

In the separation of certain minerals from the rock with which they are found associated one of the most commonly used processes is that process which involves mixing an aqueous suspension of the finely ground ore with a small amount of a suitable oil in such a manner that the valuable mineral particles are floated to the surface of the suspension, while the waste gangue is not thus floated. One of the oils commonly used in ore flotation is an oil which is derived from coal tar and which distills within the approximate range of 160° C. and 280° C. This oil contains tar acids, hydrocarbon oils and a small amount of organic bases of the pyridine series.

It had been found by experiment that the presence of the organic bases of the pyridine series is not essential to the proper flotative properties of this oil and that oils which contained none of these pyridine bases may have just as much value in ore flotation as had the oils which did contain these bases. If, however, an attempt is made to extract the pyridine bases from the flotation oil by agitating the oil with sulfuric acid and separating the acid solution, it has been found that the oil remaining after this extraction with acid is much inferior to the original oil in its flotative properties. The decreases in the flotative properties of the oil, is due not to the removal of the pyridine bases, but to certain other changes which have taken place in the oil during the acid treatment, and to the fact that the oil remaining after the acid treatment still retains a small amount of sulfuric acid and the sulfonic acids of some of the hydrocarbons present.

This present invention relates to a process for neutralizing the oil and rendering it again an efficient flotation oil. The invention consists essentially in agitating the oil, after extraction with acid, with an excess of a so-called carbolate solution, which carbolate solution consists essentially of a solution of the alkali salts of tar acids, as, for example, the alkali salts of phenol or cresol or a mixture of phenol and cresol. Practically the same effect can be secured by agitation of the oil, after the extraction with acid, with a solution of an alkali, as, for example, sodium hydroxide or sodium carbonate. In this case, however, the results obtained are not quite so beneficial as are the results obtained by the use of the carbolate solution.

While it is not intended to restrict the process to any particular theory for explaining how the beneficial results are obtained by this treatment, it may be stated that, so far as has been ascertained from the results secured, the salts with which the oil is washed appear to remove any sulfuric or sulfonic acids that may have been present and the oil becomes saturated with salts of the tar acids.

In practicing this invention the oil which is to be used for flotation oil may first be agitated with an amount of sulfuric acid sufficient to extract all or a portion of the pyridine bases present. The mixture is then allowed to settle until the acid layer has separated as completely as possible from the oil layer. The acid layer is then drawn off and treated to recover the pyridine bases by any of the well known methods. The extracted oil is then agitated with an excess of a solution of the alkali salts of the tar acids and is again allowed to stand until settling has taken place. The excess of the carbolate solution is then drawn off and the neutralized oil is ready for use as a flotation oil.

Claim:

The herein described process, which comprises the removal, by extraction with an acid, of pyridine bases from a hydrocarbon oil for flotation purposes prepared from coal tar distillates, and then neutralizing the acid in the oil by agitating it with a solution of the alkali salts of tar acids.

In testimony whereof I affix my signature.

FREDERICK H. RHODES.