

UNITED STATES PATENT OFFICE

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PROCESS FOR REFINING MINERAL OIL

No Drawing.

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My invention relates to the refinement of mineral oils and is especially applicable to mineral oils containing suspended and dissolved impurities which have been produced by oxidation or cracking of the oils. The processes which have hitherto been in general use for refining these oils involve treatment of the oils with solutions of inorganic alkaline materials or with sulfuric acid. The disadvantages in these processes are the tendency to formation of very stable emulsions and the difficulty of complete removal of the treating agent, whose presence in the refined oil is objectionable.

I have found that these difficulties are avoided by treating the oil with triethanolamine, either with or without prior or subsequent addition of water. By this method the suspended and dissolved impurities are coagulated or thrown out of solution and can readily be removed by any suitable means. An appreciable reduction in the quantity of material of an acidic nature in the oil is effected.

By the term "triethanolamine" I wish to include pure triethanolamine and those products known as commercial triethanolamine or also those products containing a substantial proportion of triethanolamine.

In some cases, especially in the treatment of a dark-colored oil, it may be advisable to further treat the oil in known manner with a bleaching agent whereby the color of the oil is considerably improved.

The following specific example illustrates a preferred way of carrying out my improved process. A mineral oil which has been used in an internal combustion engine and contained 4.5% by volume of finely divided suspended "carbon" and which had a neutralization value of 0.51 mg. potassium hydroxide per gram of oil was heated to 90° C. and 1/2% by volume of triethanolamine was added, followed by 25% by volume of hot water. The mixture was agitated at 90° C. for one-half hour and then separated by passage through a centrifugal purifier. The purified oil was clean and bright, contained no sediment, and had a neutralization number of 0.25 mgs. potassium hydroxide per gram of oil. The oil was then given a treatment with 15% by

weight of fuller's earth to restore it to its original color.

The amount of triethanolamine which should be added will, of course, vary with the degree of contamination of the oil by oxidized and cracked products. As little as 1/10% by volume of commercial triethanolamine is sometimes sufficient, while as high as 1 1/2% may be added, although so large a percentage is seldom, if ever, required. When the treating agent is a product which contains triethanolamine, the minimum amount of the treating agent must be increased so that not less than about 1/10% by volume of triethanolamine will be present in the mixture. The temperature at which the process is conducted may vary considerably from that specified. The process does not exclude treatment of the oil, usually prior to the final bleaching, for removal of any undesirable high boiling constituents.

What I claim and desire to protect by Letters Patent is:

1. The process of treating used mineral lubricating oil containing suspended and dissolved impurities produced by oxidation and cracking in order to effect the removal of such impurities which comprises adding to the oil not less than one-tenth of one percent of triethanolamine to effect coagulation of said impurities and separating the reaction products from the oil.

2. The process of treating used mineral lubricating oil containing suspended and dissolved impurities produced by oxidation and cracking in order to effect the removal of such impurities which comprises adding to the oil not less than one-tenth of one percent of triethanolamine and also hot water, and separating the reaction products from the oil.

In testimony of which invention, I have hereunto set my hand, at Poughkeepsie, New York, on this fourth day of August, 1930.

MELVIN A. DIETRICH.

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