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UNITED STATES PATENT OFFICE

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PROCESS OF TREATING HYDROCARBONS

No Drawing. Original application filed October 15, 1923, Serial No. 668,481. Divided and this application filed October 24, 1927. Serial No. 228,500.

This application is a division of my former application, Serial No. 668,481, filed October 15th, 1923.

This invention relates to improvements in a process of treating hydrocarbon oils, and refers more particularly to the treatment of cracked residual oils to eliminate the settling out of more or less of the coke forming particles therein.

With the advance made in the cracking of hydrocarbon oils in the past few years, there has arisen an ever increasing problem in that some of the residual oils withdrawn from the still or expansion chamber have a certain amount of coke-forming substantially solid particles suspended therein. These particles remain in suspension for short or longer periods of time, but eventually settle out. For instance, a certain portion may settle in the run-down lines with a consequent slowing up of the flow and eventual clogging up of the pipe. When used as fuel, the larger coke forming particles of the residual oil will eventually clog the nozzle of the burner pipe. These coke forming or pitch-like particles are dispersed throughout an external phase consisting of relatively clear oil. The particles in the internal phase vary in size but a great many of them, and especially the aggregate, can be seen with a microscope.

I have discovered that by stabilizing the coke-forming particles in the oil, a state resembling emulsification exists, and the coke forming particles remain suspended in the oil more or less permanently. This stabilization is produced as follows:

I subject some residual oils to homogenization which may be accomplished by forcing the oil under high pressure through small minute apertures in order to obtain a finely divided dispersion, or the homogenization may be accomplished by subjecting the particles to mechanical impact which will tend to break the substantially solid coke forming particles, or the oil subjected to a strain to cause breaking of the larger particles into smaller particles in the usual colloid mill. With some oils, it may be desirable to apply heat before attempting to homogenize, as a semi-solid will homogenize more readily than a solid. In addition, it has been found that these particles or aggregates of the particles will assume a globular semi-solid form when subjected to heat.

Homogenization of certain types of residual oils will not stabilize the coke forming particles so as to secure a substantially permanent suspension. I propose to add a stabilizing agent, usually of a colloid nature and soluble in the oil, for instance, soaps of the alkaline earth metals, such as calcium and magnesium oleate, stearate or resinate, to the oil. The mixture is then agitated for a period of time sufficient to make a substantially permanent suspension, the oil being in the external phase, and the coke forming particles in the internal phase.

The agitation may be accomplished by the homogenization heretofore explained.

By treating the residual oils in the manner described, it has been found that a relatively stable suspension is produced, resulting in a dispersion of the coke forming particles through the oils, which will remain suspended for a considerable period of time.

An example of a working formula for the addition of an alkaline earth metal soluble in the oil may be illustrated as follows—from 0.1 to 2% of the alkaline earth soap is dissolved in the residual oil, and the latter then homogenized, or the alkaline earth soap may be dissolved first in a lighter oil such as gas oil, and this solution added to the cracked residual oil so that the final proportion of the soap in the oil is 0.1 to 2%.

I claim:—

1. A process for stabilizing the coke-forming particles of hydrocarbon residual oils resulting from an oil cracking process comprising introducing to the residual oil an alkaline earth metal soap and in subjecting the residual oil to which the alkaline earth metal soap has been introduced to a homgenizing treatment.

2. A process for stabilizing the coke-forming particles of hydrocarbon residual oils resulting from an oil cracking process comprising introducing to the residual oil containing such coke-forming particles an alkaline earth metal soap, subjecting the residual oil sub-

sequent to the introduction of such alkaline earth metal soap to a homogenizing action by agitating the mixture producing a material having the oil in the external phase and the coke-forming particles in the internal phase.

3. A process for stabilizing the coke-forming particles of hydrocarbon residual oils resulting from an oil cracking process comprising adding to the residual oil containing the coke-forming particles a colloidal stabilizing agent, subjecting the residual oil subsequent to the addition of such colloidal stabilizing agent to a homogenizing treatment.

In testimony whereof I affix my signature.

JACQUE C. MORRELL.