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UNITED STATES PATENT OFFICE

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TREATMENT OF PETROLEUM DISTILLATES

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This invention relates to the treatment of petroleum distillates, in particular cracked hydrocarbon distillates, for the specific purpose of sweetening same.

In the ordinary refining of distillates, they are subjected to sulphuric acid treatment and caustic soda in separate steps and to distillation following such treatment. In addition to the ordinary treatment, to produce a product of good color, odor and stability, a so-called sweetening treatment may be required which consists essentially in the removal of hydrogen sulphide and mercaptans. The hydrogen sulphide is very readily removed but the mercaptans are removed or converted only with considerable difficulty. In the past the usual method of sweetening has been to treat with so-called doctor solution, which consists of a solution of litharge in caustic soda and which is used in combination with elementary sulphur. The mercaptans are converted by this treatment into compounds which do not react to give the so-called positive doctor test. The present invention has for its purpose the substitution for the older and more involved method of treatment of a much simpler method and according to which the oil is subjected directly to the action of ultra violet light or X-rays. The reaction is especially marked in the presence of air. Presumably the reaction is the direct oxidation of the mercaptans to disulphides.

I have found that on exposing distillates containing mercaptans to X-rays which are not included in the ultra violet light portion of the spectrum, but which are a highly special ray used in medical practice, that the gasoline was sweetened in less than ten minutes by such exposure. With the actinic rays, a much longer time is required. My process, therefore, comprises the exposure of gasoline to ultra violet light, especially while bubbling air or other oxidizing gas therethrough, relates particularly to the use of X-rays for sweetening while bubbling air or other oxidizing gas e. g. an oxide of nitrogen through the oil undergoing treatment. In carrying out the process, the oil is caused to flow through a conduit through which the actinic or X-rays can be passed while bubbling through air or other oxidizing gas.

As an example of results obtainable by the process, a sour gasoline, that is one containing mercaptans, was exposed to X-rays while bubbling air through the gasoline and after ten minutes exposure the gasoline was sweet and had improved in odor. The finished gasoline was 57 Baumé gravity with an initial boiling point of 105° F. and an end point of 437° F.

I claim:

1. A step in the refining of hydrocarbon distillates containing mercaptans which comprises subjecting the distillate to the action of X-rays.

2. A step in the refining of hydrocarbon distillates containing mercaptans which comprises subjecting the distillate to the action of X-rays, in the presence of oxygen.

3. A process for refining cracked gasoline which comprises exposing the same to X-rays while bubbling air therethrough.

In testimony whereof I affix my signature.

LEV A. MEKLER.