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PROCESS FOR THE RECOVERY OF AROMATIC COMPOUNDS.

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To all whom it may concern:

Be it known that I, FRANCIS X. GOVERS, residing at 800 Riverside Drive, borough of Manhattan, city, county, and State of New York, a citizen of the United States, have invented certain new and useful Improvements in Processes for the Recovery of Aromatic Compounds, of which the following is a specification.

My process relates to the recovery of aromatic compounds from mixtures or solutions of same with saturated or unsaturated non-aromatic hydrocarbons.

In the breaking down of high boiling point hydrocarbons of the paraffin or naphthene series into aromatic hydrocarbons, there are formed at the same time a number of paraffins and unsaturated hydrocarbons of the same or approximately the same boiling points as the aromatic compounds sought for. These unsaturated compounds and compounds of the paraffin series are difficult, if not impossible, to separate from the aromatic hydrocarbons desired by fractional distillation and while by treatment with acid and subsequent treatment with caustic-soda and washing the unsaturated compounds may be eliminated, they are frequently present to such an extent as to require a very large amount of acid for their removal. The presence of either unsaturated compounds or compounds of the paraffin series with aromatic compounds interferes with many uses of such compounds; for example in the manufacture of explosives, it seriously hinders the process of nitration and certain amounts of both or either of these compounds make it, if not impossible to nitrate, at least a dangerous undertaking. I have found that a quick and easy method of separating both unsaturated compounds and paraffin compounds from the aromatic hydrocarbons wanted is to subject the mixture to fractional distillation, and take fractions around the boiling point of the hydrocarbon desired; for instance, in case benzol is wanted, a cut may be taken from 78° to 82° C. and in case toluol is wanted, a cut from 108° to 112° C. The respective cut or cuts so made are then subjected to a heat treatment advantageously under pressure. This heat treatment is so conducted in reference to the compound to be purified that the paraffins are converted into compounds of lower boiling point and the unsaturated compounds are converted into gas or polymerized so that the simple distillation removes first the lower compound hydrocarbons and then the aromatic compound desired, leaving behind the high boiling point polymerized products.

The following is an example of the foregoing process: A fraction obtained from distillation of the product derived from cracking California petroleum, such fraction distilling between 108° and 112° C. and containing some unsaturated hydrocarbon compounds and other compounds of the paraffin series is subjected to heat treatment in a tube furnace at a temperature of approximately 525° C. and a pressure of about 500 lbs. This temperature and pressure is such that the aromatic compounds are not changed but the unsaturated compounds and the compounds of the paraffin series are changed in the treatment to either lower boiling point compounds or higher boiling point compounds. The product of the heat treatment is then subjected to fractional distillation and the desired aromatic compounds recovered substantially free from contaminating compounds.

It will be obvious from the foregoing that many variations may be made in the details of operation without departing from the spirit and scope of my invention.

What I claim is:

1. In the process of purifying an aromatic compound in a mixture of substantially uniform boiling point containing it and contaminating non-aromatic hydrocarbon compounds having substantially the same boiling point, subjecting said mixture to heat treatment under conditions of temperature and pressure such as to change the contaminating substances to compounds of higher or lower boiling point without changing the aromatic compounds desired.

2. In the process of purifying aromatic compounds in mixture containing them and contaminating non-aromatic hydrocarbon compounds having substantially the same

boiling points as the respective aromatic compounds desired, subjecting the mixture to fractional distillation to obtain mixtures of substantially uniform boiling point of the respective aromatic compounds with contaminating non-aromatic compounds having substantially similar boiling points and subjecting the respective mixtures to heat treatment under conditions of temperature and pressure such as to change the contaminating substances to compounds of higher or lower boiling point without changing the aromatic compounds desired.

FRANCIS X. GOVERS.