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PROCESS FOR RECOVERING NEUTRAL SUB-
STANCES CONTAINING OXYGEN FROM
OILS CONTAINING SUCH SUBSTANCESRudolf Bemmman, Leuna, Germany; vested in the
Alien Property CustodianNo Drawing. Application April 9, 1941, Serial No.
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4 Claims. (Cl. 260—593)

The present invention relates to a process for recovering neutral substances containing oxygen from oils containing such substances.

The tars and oils obtained by the thermal treatment, for example the low temperature carbonization or destructive hydrogenation of mineral coal, brown coal, peat, wood, bituminous shale or similar materials, are known to contain in the lower fractions in addition to hydrocarbons smaller percentages of neutral substances containing oxygen, in particular ketones, alcohols, ethers and esters, hereinafter briefly referred to as the "neutral oxygen substances."

While in the carbonization of wood these neutral oxygen substances are formed in a quantity which allows them to be easily separated from the tars and oils and divided into their components by fractional distillation, in products obtained by the low temperature carbonization or destructive hydrogenation of coal, peat or bituminous shale they are contained in so small a percentage that their recovery was not possible from an economical point of view.

I have now found that the neutral oxygen substances contained in the fractions, boiling below about 180° C. and preferably between about 30 and 150° C., of the said oils can be recovered in a simple manner by extracting them with a solution of an alkali metal phenolate and afterwards separating them from the phenolate solution. I have made the discovery that phenolate solutions have a high selective dissolving power towards the said neutral substances, especially to ketones and alcohols.

From the phenolate solutions the neutral oxygen substances can be extracted with the aid of suitable solvents, for example chlorinated hydrocarbons, the boiling point of which is preferably widely different from that of the neutral oxygen substances so as to make their separation easier. Since as a rule the neutral oxygen substances boiling between about 50 and 150° C. are desirable, solvents are used which boil below 50° C., as for example methylene chloride, or such as boil above 150° C., as for example a phenol fraction.

The neutral oxygen substances can be separated from the phenolate solution also by distillation, preferably with the introduction of inert gases or water vapor. The distillate containing water and the neutral oxygen substances usually separates into two liquid layers, of which the lower one contains the greater portion of the water along with acetone and methylethylketone, whereas the upper one contains little water and, in addition to acetone and methylethylketone,

alcohols containing more than 3 carbon atoms, ketones containing more than 4 carbon atoms, and a small amount of light-boiling hydrocarbons.

5 In case the phenolate solution used for extraction also contains dissolved hydrocarbons, a distilling column can be used which is fitted with a reflux condenser and allows to remove first the lighter boiling neutral oxygen substances from the solution and then the higher boiling hydrocarbons.

10 It is advantageous to combine the process according to the present invention with the usual working up of tars or other oils containing phenols. For this purpose the oil is divided into a light oil boiling below about 180° and a middle oil containing phenols. By treating this middle oil with caustic soda a phenolate solution is obtained which serves for the extraction of the neutral oxygen substances from the low boiling fraction of the initial oil. The phenolate solution, after the removal of the neutral substances by distillation or extraction, is acidified and freed from the phenols in known manner.

15 The following example serves to illustrate how the present invention may be carried out in practice but the invention is not restricted to the example.

Example

30 100 parts (by volume) of a gasoline boiling between 30 and 150° C. and obtained by the destructive hydrogenation of brown coal in the liquid phase are extracted with 100 parts (by volume) of a solution of an alkali metal phenolate obtained by mixing 25 parts (by volume) of a phenol-cresol mixture with 75 parts (by volume) of caustic soda solution of 10 per cent strength. The phenolate solution is then distilled in a still provided with a column. During this distillation 40 3 parts (by volume) of a distillate pass over between 55.5 and 58° C., having a spec. gravity of 0.787 and mainly consisting of acetone, while another 3 parts (by volume) of a distillate having a spec. gravity of 0.814 and mainly containing methylethylketone in addition to some acetone 45 and water are obtained between 58 and 87° C.

What I claim is:

1. A process for recovering organic neutral substances containing oxygen selected from the class consisting of ketones, alcohols, ethers and esters from a hydrocarbon oil boiling below about 180° C. containing them which comprises extracting the oil with a solution of an alkali metal phenolate and then separating the neutral oxygen substances from the extract.

2. The process as claimed in claim 1 which comprises separating the said neutral substances from the phenolate solution by distillation.

3. The process as claimed in claim 1 which comprises separating the said neutral substances from the phenolate solution by extraction with an organic solvent.

4. A process for recovering organic neutral

substances containing oxygen selected from the class consisting of ketones, alcohols, ethers and esters from a hydrocarbon oil boiling between about 30 and 150° C. which comprises extracting the oil with a solution of an alkali metal phenolate and then separating the neutral oxygen substances from the extract.

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