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PROCESS OF MANUFACTURING HARD BITUMINOUS MATERIALS

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4 Claims. (Cl. 196—74)

This invention relates to a process for manufacturing hard bituminous materials and particularly bituminous materials which are harder than similar materials of the same softening points.

Bituminous materials are used in the construction of molded objects such as electric storage battery boxes. The bituminous materials that have heretofore been found suitable are the better grades of natural bituminous materials known as "glance pitch", large quantities of which are imported into this country. These bituminous materials are acid-proof and have the necessary high softening points, hardness and toughness.

It has been discovered that residues, which are formed during the cracking of a petroleum distillate oil, may be treated according to a process hereafter disclosed to produce bituminous materials which have equal, if not superior, properties such as being acid-proof and also having the necessary hardness and toughness.

In accordance with the present invention, this may be accomplished in the following manner:

Petroleum distillate oils are subjected to cracking temperatures and pressures to convert the high boiling compounds to lower boiling compounds such as gasoline. In cracking the petroleum distillate oils to gasolines, for best results care is taken that the conversion is not carried so far that coke deposits are produced in the cracked residue. The resulting residue is distilled either under vacuum or in the presence of steam, either batch or continuously, to remove the lower boiling point portions of the cracked residue and obtain a soft flux having a softening point of 80° to 90° F. Care is taken during the distillation that no further cracking takes place. The soft flux having a softening point of 80° to 90° F. is then oxidized by contacting with air or a gas containing free oxygen to a bituminous product having a softening point not materially below 280° F. and upwards of 300° F.

Hard bituminous materials may be prepared by straight reduction under vacuum or in the presence of steam. These products do not have the same desirable physical characteristics as when an 80° to 90° F. softening point soft flux is oxidized.

The following table illustrates the physical characteristics of a hard bituminous material obtained by oxidizing an 80° F. melting point residuum obtained from cracking petroleum distillate oil, and Cuban glance pitch:

	Cuban glance pitch	Hard bituminous material
Specific gravity at 60° F	1.110	1.137
Softening point (B. & R.)	277° F.	290° F.
Penetration 77° F./100 g./5 seconds	0	0
Penetration 100° F./100 g./5 seconds	0	0
Penetration 135° F./100 g./5 seconds	0	0
Penetration 150° F./100 g./5 seconds	1	¾
Penetration 175° F./100 g./5 seconds	11½	5
Soluble in nitro-benzene	98.36%	99.44%
Soluble in carbon disulfide	98.32%	98.95%
Insoluble in 86° naptha	68.28%	64.47%
Fixed carbon	29.14	32.03

The determination of the distance a standard needle will penetrate the sample in a fixed time, in 1/100ths of a centimeter, is a measure of the softness of the asphalt and is known as the penetration test. The sample is placed in a dish of standard size and immersed in a bath at the desired temperature for a period of time. The following measurements are generally made:

Temperature °F.	Weight of needle and weight	Time for penetration	Method of designation
115	50	5	115°/ 50/ 5
77	100	5	77°/100/5
32	200	60	32°/200/60

A further improved product may be obtained by dissolving the above oxidized bituminous material in benzol, separating the insoluble material and recovering the refined product by evaporation of the solvent. The physical characteristics of this refined product are illustrated by the following analyses of the several products:

	Cuban glance pitch	Hard bituminous material	Refined hard bituminous material
Softening point (B. & R.)	277° F.	288° F.	265° F.
Penetration 175° F./100 g./5 sec.	11½	6	7
Soluble in benzol	97.39%	81.90%	95.34%

This invention is not to be limited by any

theory or the particulars given by way of illustration but only by the following claims in which it is my intention to claim all novelty inherent in the invention.

I claim:

1. A process of manufacturing a hard bituminous material from a tar obtained by cracking a petroleum distillate oil, comprising subjecting the tar to vacuum distillation to reduce the tar to an 80° to 90° F. softening point material and contacting the said material with a gas containing free oxygen to produce a bituminous material having a softening point over 275° F.

2. A process of manufacturing a hard bituminous material having a specific gravity of over 1, a softening point above 265° F., and a penetration of 0 at 135° F. using a 100 gram weight for 5 seconds, comprising subjecting a residuum oil obtained in cracking a petroleum distillate oil to vacuum distillation to reduce the residuum oil to an 80° to 90° F. softening point, contacting the reduced residuum oil with a gas containing free oxygen to obtain a bituminous material having a softening point over 275° F., dissolving the bituminous material in an asphalt dissolving solvent, such as benzol, separating the insoluble materials and evaporating the solvent from the dissolved bituminous material.

3. A process of manufacturing a bituminous material having a specific gravity of over 1, a softening point above 265° F., a penetration of 0 at 135° F. using a 100 gram weight for 5 seconds and over 98% soluble in carbon disulfide, comprising subjecting cracking coil tar obtained in the pressure cracking of petroleum distillate oil after the tar had been subjected to non-oxidizing distillation to give a residue having a softening point of 80° to 90° F. to oxidation by contacting the residue with a gas containing free oxygen to produce a 275° to 300° F. softening point bituminous material.

4. A process of manufacturing a hard bituminous material from a residuum oil obtained in cracking a petroleum distillate oil, comprising subjecting a residuum oil obtained in cracking a petroleum distillate oil, to vacuum distillation to reduce the residuum oil to an 80° to 90° F. softening point, contacting the reduced residuum oil with a gas containing free oxygen to obtain a bituminous material having a softening point over 275° F., dissolving the bituminous material in benzol, separating the insoluble materials and evaporating the solvent from the dissolved bituminous material.

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