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MANUFACTURE OF ASPHALT

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This invention relates to the manufacture of asphalt; and it is among the objects of the invention to provide improved procedure facilitating preparation of desired products with celerity and convenience. Other objects and advantages will appear as the description proceeds.

To the accomplishment of the foregoing and related ends, the invention, then, comprises the features hereinafter fully described, and particularly pointed out in the claims, the following description setting forth in detail certain illustrative embodiments of the invention, these being indicative however, of but a few of the various ways in which the principle of the invention may be employed.

The raw stock to be treated, as a petroleum residuum, left after hydrocarbons through lubricating cuts have been taken, is subjected to the action of heat in the presence of available oxygen, and being in exposure to the gaseous medium providing oxygen, there is transmitted by the same medium a small amount of a catalytic agent, the gaseous medium providing oxygen thus at the same time acting as carrier for the catalyst. While oxygen as such can be used, in practice it is more desirable to employ air, and while agitation and commingling may be accomplished in various ways, desirably the residuum is subjected to air-blowing. As catalyst, I employ an agent of gasiform character, or at least capable of being carried along by an air stream in suitable amounts. For this, I may employ Cl_2O , COS , chlorine, oxides of nitrogen, as NO , NO_2 , hydrogen selenide, hydrogen sulphide, aliphatic mercaptans, as ethyl mercaptan and butyl mercaptan, particularly n-butyl mercaptan, sulphur trioxide, sulphur dioxide, and ozone. Those in which there is chlorine, or nitrogen or sulphur are in general quite convenient. The amount of catalyst is small, as for instance 0.001–1.0 per cent, and where an air stream is employed as primary reagent the gasiform catalyst may be proportionally fed along therewith. The temperature of treatment is in general 400 to 550° F.

Very advantageously also in practice, the residuum may be air-blown or oxidized as usual to a partial conversion to desired specifications, whereupon the active non-catalytic air-blowing is stopped, and with the residuum held at elevated temperature and agitated by mechanical means, the gasiform catalyst, as above men-

tioned, is mixed into the residuum in catalytic amount, and the reaction completed to the final desired specifications of penetration, melting point etc.

As an example: A petroleum residuum from Mid-Continent stock, as a pipe still bottoms, having initially a penetration of 200 at 77° F., is subjected to air-blowing by air containing 0.1 per cent of chlorine, the temperature being maintained at 525° F. for 8 hours.

Other modes of applying the principle of the invention may be employed, change being made as regards the details described, provided the features stated in any of the following claims, or the equivalent of such, be employed.

I therefore particularly point out and distinctly claim as my invention:—

1. A process of making asphalt, which comprises heating at 400–550° F. and agitating petroleum residuum to partial asphalt-conversion with air, then without substantial cooling introducing into the residuum a small amount of a gasiform catalyst.

2. A process of making asphalt, which comprises heating and air-blowing residuum to partial asphalt-conversion then maintaining the residuum at a temperature of 400–550° F. and further blowing with air while transmitting with the air a small amount of a gasiform catalyst.

3. A process of making asphalt, which comprises heating and air-blowing petroleum residuum to partial asphalt-conversion, then maintaining the residuum at a temperature of 400–550° F. and further blowing with air while transmitting with the air a small amount of an oxide of nitrogen catalyst.

4. A process of making asphalt, which comprises heating and air-blowing petroleum residuum to partial asphalt-conversion, then maintaining the residuum at a temperature of 400–550° F. and further blowing with air while transmitting with the air a small amount of a chlorine catalyst.

5. A process of making asphalt, which comprises heating and air-blowing petroleum residuum to partial asphalt-conversion, then maintaining the residuum at a temperature of 400–550° F. and further blowing with air while transmitting with the air a small amount of a sulphur-containing catalyst.

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