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(54) **PROCESSING OF KEROSENE**

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(57) **ABSTRACT**

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A method of thickening liquid hydrocarbons comprises mixing the hydrocarbon with an essentially paraffin polyolefin polymer in solid form to yield a thickened homogeneous solution. The hydrocarbon is preferably kerosene and the polymer may be a "Vistanex" polymer. The product may be used as a lamp oil but may also be applied to charcoal for use as a lighting fuel for barbecues.

PROCESSING OF KEROSENE

[0001] This invention relates to the processing of kerosene, a complex liquid hydrocarbon fuel oil, originally distilled from coal, bitumen and/or petroleum. Kerosene typically has a boiling point in the range 180-230° C.

[0002] Certain forms of kerosene are used extensively as lamp oils but are also used absorbed on charcoal as a fuel for lighting barbecues. Traditionally, these preparations have been formulated with added colouring and/or fragrance components essentially to deodorise or mask the characteristic hydrocarbon smell.

[0003] A recent European Union Directive relating to the sale of lamp oils seeks to prohibit the colouring and/or fragrancings of these oils

[0004] It is an object of the present invention to provide a means of thickening kerosene and other hydrocarbon solvents with a view to permitting the presence of additives and preferably to enhance the perception and performance of the hydrocarbon as a fuel. However, kerosene for most purposes is not generally susceptible to being successfully thickened.

[0005] According to one aspect of the present invention, a method of thickening liquid hydrocarbons comprises mixing the hydrocarbon with an essentially paraffin polyolefin polymer in solid form to yield a thickened homogenous solution.

[0006] According to another aspect of the invention, a composition of matter comprises a thickened homogenous solution of an essentially paraffin polyolefin polymer in solid form dissolved in a liquid hydrocarbon.

[0007] The product of the invention, that is, either the composition of matter or the product of the method, may be used as a lamp oil but may also be applied to charcoal for use as a lighting fuel for barbecues, for which it is superior to unthickened hydrocarbon fuels as such in providing better adhesion and absorption of fuel onto the charcoal and also in providing enhanced burning times and burn rates. Additive materials for the deodorising, colouring and/or enhancement of the product perception may be mixed with the inventive composition while still remaining with the terms of the lamp oil directive.

[0008] For most purposes, the liquid hydrocarbon comprises commercial kerosene having a boiling point in the range 180-230° C., preferably a low odour kerosene having a flashpoint greater than or equal to 62° C., typically 63 to 68° C. The polyolefin polymer may be a medium or high molecular weight polymer of an alkene, preferably a branched chain alkene such as polyisobutylene. In polymerisation of such polymers, the olefinic unsaturation is removed except at the terminal moieties. The preferred molecular weight is in the region of 1.4 to 2.0, (viscosity average $\times 10^{-6}$), a suitable polymer being commercially available under the trade name 'Vistanex', such as 'Vistanex MML-120'. Such compounds, which are generally used as plasticisers, resemble uncured natural and synthetic rubbers in their physical properties and, when mixed with a hydrocarbon solvent according to the present invention, the polymer initially swells in volume as it appears to imbibe the solvent. Preferably, the polymer is ground to form granules or particles before being added to the solvent, the individual granules or particles thereof eventually breaking up and becoming dissolved and homogenous in the solvent. The

higher is the surface area to volume ratio of the granules or particles, the faster will be the rate of dissolution.

[0009] An embodiment of the invention will now be described by way of example.

EXAMPLE

[0010] A thickened kerosene formulation contains the following ingredients:

| Material | % W/W | |
|---------------------------------------|---------|---------------|
| Low Odour Kerosene | 90-100 | typically 95 |
| Polyolefin polymer (Vistanex MML-120) | Up to 5 | typically 2.5 |
| Fragrance material (optional) | Up to 5 | typically 2.5 |

[0011] Such a formulation has the following properties:

| | | |
|-------------|--------------------------|----------------------|
| Density | 0.75-0.80 gm/ml @ 20° C. | typically 0.78 gm/ml |
| Flash point | 62-66° C. | typically 63-65° C. |

[0012] The formulation can be used as a lamp oil.

1. A method of thickening liquid hydrocarbons, the method comprising mixing the hydrocarbon with an essentially paraffin polyolefin polymer in solid form to yield a thickened homogenous solution.

2. A method according to claim 1, in which the liquid hydrocarbon comprises commercial kerosene.

3. A method according to claim 2, in which the kerosene comprises a low odour kerosene having a flashpoint greater than or equal to 62° C.

4. A method according to claim 1, in which the polyolefin polymer comprises a medium or high molecular weight polymer of an alkene.

5. A method according to claim 4, in which the alkene comprises a branched chain alkene.

6. A method according to claim 1, in which the polymer has a molecular weight in the range 1.4 to 2.0×10^6 .

7. A composition of matter comprising a thickened homogenous solution of an essentially paraffin polyolefin polymer in solid form dissolved in a liquid hydrocarbon fuel oil.

8. A composition according to claim 7, in which the fuel oil comprises kerosene.

9. A composition according to claim 8, in which the kerosene comprise commercial kerosene.

10. A composition according to claim 7, in which the polyolefin polymer a medium or high molecular weight polymer of an alkene.

11. A composition according to claim 10, in which the alkene comprises a branched chain alkene.

12. A composition according to claim 7, in which the polymer has a molecular weight in the range 1.4 to 2.0×10^6 .

13. A composition according to claim 7 for use as a lamp oil.

14. A composition according to claim 7 for use as a barbecue lighting fuel.