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(54) Title: FIRELIGHTER

(57) Abstract: A firelighter composition comprises a mixture of a liquid hydrocarbon and lignite. The liquid hydrocarbon preferably comprises kerosene. It has been found that lignite has the effect of extending the burn time and lowering the flame height, thereby increasing the combustion efficiency for a given weight of firelighter.



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Firelighter

This invention relates to firelighters, that is, flammable compositions in solid form for use in lighting fires.

Solid block flammable firelighters are manufactured so that the product is either white in colour or grey-black, according to the national target market. Conventional firelighters contain kerosene as the flammable ingredient together with a resin binder, typically a urea/formaldehyde resin, water, emulsifier and, for grey-black firelighters, a colouring material. Peat is also used in grey-black firelighters as a filler and to modify the combustion properties of the kerosene.

Conventional white firelighters are to some extent wasteful of heat in that they burn with a flame height which is higher than required in most grates.

It is an object of the present invention to provide an improved firelighter composition which enhances the characteristics of conventional white firelighters.

In one aspect, the invention provides a firelighter composition comprising a solid emulsion of a fuel distributed or dispersed within a solid matrix of an aqueous cured resin, in which the fuel comprises a liquid hydrocarbon and lignite, the total water content of the composition being from 12.5 to 20 parts by weight.

In firelighter compositions according to the invention, the lignite may optionally be partially substituted by peat.

Lignite is a soft brown fuel with a lower carbon content than coal but a higher moisture content which, nevertheless, crumbles readily and can be comminuted to form granules. Being a natural product, lignite comprises a heterogeneous mixture of compounds for which there is no single chemical structural formula. It has surprisingly been found that, when used as a component of a firelighter composition, lignite has the effect of extending the burn time and lowering the flame height, thereby increasing the combustion efficiency for a given weight of firelighter. In firelighter compositions containing peat, the use of lignite enables a

lower concentration of peat to be used and, indeed, as with white compositions, also a lower relative amount of kerosene or other hydrocarbon in the overall composition.

Preferably, lignite in the present invention is used in the form of granules of particles size 2 to 6 mm, more preferably 3 to 4 mm. The granules may be formed from naturally-occurring lignite, ground and sieved to the desired particle size, and/or from lignite dust, obtained for example as a by-product of the grinding process, mixed with a petroleum wax such as "Kerowax" as a binder and ground and sieved to the desired particle size as above.

In firelighter compositions according to the invention, the total fuel (hydrocarbon and lignite) concentration should preferably be from 50 to 85 parts by weight of the total composition. Assuming the hydrocarbon is kerosene, the weight ratio of lignite to kerosene may vary from 0.2% to 50%, preferably 5% to 25%, depending on the properties required of the composition. Thus, a lower requirement for lignite results in a higher requirement for kerosene, to meet the total fuel requirement.

Firelighter compositions according to the invention may include, either as an additive component of the fuel or as a filler or extender, minor amounts of other solid organic or inorganic materials such as coal dust or particles, wood flour, silicon dioxide and aluminium oxide. Such additional ingredients preferably do not exceed 10% by weight, preferably not more than 5 % by weight. Where such ingredients as fuel components are absent, the fuel consists essentially of a liquid hydrocarbon and lignite.

Firelighter compositions are generally manufactured as solid blocks in which the fuel is distributed or dispersed within the solid matrix of an aqueous cured resin, forming a solidified emulsion. Preferably, the resin comprises an acid-catalysed urea-formaldehyde resin and the composition also includes an emulsifier. The emulsifier may be a surfactant, preferably an anionic surfactant such as an alkyl aryl sulphonate, generally provided as an aqueous solution.

The total water content of compositions according to the invention, including naturally-occurring water in the lignite and any water present in the solution of emulsifier, is preferably 15 to 17.5 parts by weight.

Optionally, firelighter compositions according to the invention include a trace amount of fragrance material for olfactory enhancement and/or masking purposes.

For a grey-black firelighter, the same formulations may be used substituting a peat-lignite mixture for the lignite and including a trace amount of a dye for colouring purposes.

In percentage terms by weight, firelighter compositions according to the invention may comprise liquid hydrocarbon (50 to 85, preferably 60 to 75%), lignite (0.1 to 20, preferably 4 to 15%), resin (5 to 15, preferably 7.5 to 12.5%), water (10 to 20, preferably 12.5 to 18%) and emulsifier (1 to 1.25, preferably 1.1 to 1.2%).

By way of example, the following formulations may be used for a white firelighter according to the invention, amounts being quoted in parts by weight:

Example 1

Kerosene	70
Lignite	10
Urea-formaldehyde resin	10
Water	16
Emulsifier (alkyl-aryl sulphonate)	1.25

Example 2

Kerosene	75
Lignite	5
Urea-formaldehyde resin	10
Water	16
Emulsifier (alkyl-aryl sulphonate)	1.25

Example 3

Kerosene	65
Lignite	15
Urea-formaldehyde resin	10
Water	16
Emulsifier (alkyl-aryl sulphonate)	1.25

In the above Examples, the urea-formaldehyde resin is Prefere (RTM) 87 1640H (CFL3) (Dynea Ireland Ltd.) and the emulsifier is Ufacid K (Ønger Fabrikker, Norway) supplied by Lankro Chemicals. The firelighters were manufactured by forming a base material by mixing together the resin, emulsifier, water and any optional additives, adding the kerosene, preferably pre-heated, and mixing at high speed to form an emulsion, and finally adding the lignite and acid catalyst and allowing the mixture to solidify by acid-initiated polymerisation of the resin.

Claims

1. A firelighter composition comprising a solid emulsion of a fuel distributed or dispersed within a solid matrix of an aqueous cured resin, in which the fuel comprises a liquid hydrocarbon and lignite, the total water content of the composition being from 12.5 to 20 parts by weight.
2. A firelighter composition according to claim 1, in which the lignite is partially substituted by peat.
3. A firelighter composition according to claim 1 or claim 2, in which the total water content is in the range 15 to 17.5 parts by weight.
4. A firelighter composition according to any preceding claim, in which the total fuel concentration is from 75 to 85 parts by weight of the composition.
5. A firelighter composition according any preceding claim, in which the liquid hydrocarbon comprises kerosene.
6. A firelighter composition according to claim 5 in which the hydrocarbon comprises kerosene, the weight ratio of lignite to kerosene being from 5% to 25%.
7. A firelighter composition according to any preceding claim, in which the lignite is in the form of granules.
8. A firelighter composition according to claim 7, in which the granules have a particle size of from 2 to 6mm.
9. A firelighter composition according to any preceding claim, in which the resin comprises an acid-catalysed urea-formaldehyde resin and the composition also includes an emulsifier.
10. A firelighter composition according to claim 9, in which the emulsifier comprises a surfactant.
11. A firelighter composition according to claim 10, in which the surfactant comprises an anionic surfactant.
12. A firelighter composition according to claim 11, in which the surfactant comprises an alkyl aryl sulphonate.
13. A firelighter composition according to any preceding claim, further including a trace amount of fragrance material.
14. A firelighter according to any preceding claim, further including a fuel additive or a filler or extender in an amount up to 10% by weight.
15. A grey-black firelighter composition according to any preceding claim, also including

peat in partial substitution for the lignite, the formulation including a trace amount of a dye for colouring purposes.