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(54) Briquettes.

(57) Briquettes for open fire use comprise fuel particles bonded together by fuel particles bonded together by means of a cured organic binder. The fuel particles comprise coal (such as dry steam coal) having a volatiles content of 10 to 14% by weight, a fixed carbon content of 77 to 87% by weight, and an ash content of 3 to 8% by weight on a dry basis.

EP 0 385 665 A2

Briquettes

The present invention is concerned with fuel briquettes and, in particular, fuel briquettes suitable for open fire use.

Many processes for briquetting coal particles are known. A long established process involves the use of a high temperature binder, such as bitumen or pitch. More recently, interest has been centred on low temperature binders, such as molasses, polyvinyl alcohol, lignosulphonates, starch and the like, as these enable the emission of smoke and other polluting products from the briquetting plant to be minimised.

Generally, fuel briquettes are made from fine coals having low smoke emission, such as anthracite.

We have now developed a fuel briquette in which the fuel particles can be of relatively lower grade coal.

According to the present invention, therefore, there is provided a fuel briquette comprising fuel particles bonded together by means of a cured organic binder, wherein the fuel particles comprise coal having a volatiles content of 10 to 14%, a fixed carbon content of 77 to 87% (such as 78 to 85%), and an ash content of 3 to 8% (such as 3 to 7%), all percentages being by weight on a dry basis.

The fuel particles typically have a moisture content of up to 15%, a sulphur content not exceeding 2% (for example, not more than 1%), a chlorine content not exceeding 1% (for example, not more than 0.1%), these percentages being again by weight, and a calorific value of 28,000 to 36,000 kJ/kg (such as 32000 to 35000 kJ/kg) on a dry basis.

The coal used in the briquettes according to the invention may be dry steam coal; in an alternative embodiment of the present invention, the coal may be a blend of two or more of anthracite coal, coking coal, lignite, bituminous or semi-bituminous coal or petroleum coke.

The coal may further contain one or more ash modification agents wihch are such as to improve the combustion properties of the briquettes by reducing the volume of uncombusted carbonaceous material falling into the undergrade. Preferred examples of such materials are iron oxide, magnesium sulphate, or sodium orthophosphate (or a mixture of two or more thereof). Such ash modification agents may be present in an amount of 0.05 to 3% by weight, based on the weight of the coal.

The briquettes according to the invention are particularly suitable for open fire use, by virtue of their relatively high volatiles content (compared to anthracite), which is, however somewhat lower than current commercial products for open fire burning. The briquettes according to the invention have a sufficiently high volatile content to make them easily ignitable, but longer burning than most current commercial open fire products. The briquettes according to the invention are capable of meeting statutory requirements for smokeless fuels, and can have very satisfactory physical strength.

The present invention further comprises a briquetting process, which comprises mixing fuel particles comprising coal as defined above with a minor amount of a curable binder, forming the mix into briquettes, and allowing the binder to cure.

The fuel particles typically have a particle size of not exceeding 22mm, such as 0 to 6 millimetres. The particle size generally corresponds to what is known as "duff".

The binder used in the briquettes according to the invention may comprise, for example, a polyvinyl alcohol (e.g., as disclosed in GB2138442 or EP135785), molasses (e.g., as disclosed in GB2181449 or GB2187754), bitumen, starch, or a lignosulphonate.

It is preferred that the binder should be such that it is curable at less than 500 °C; more preferred are binders which are curable at less than 350 °C (such as 150 to 350 °C). Curing is, accordingly, preferably carried out at a temperature in the range of 300-350 °C.

The mix may be formed into briquettes by any conventional technique, such as extrusion, roll-pressing, die-pressing, or rotary table pressing.

The resulting briquettes may, if desired, be post-treated so as to improve their water-resistance, appearance, or other properties, by any conventional technique.

Claims

1. A fuel briquette comprising fuel particles bonded together by means of a cured organic binder, wherein the fuel particles comprise coal having a volatiles content of 10 to 14%, a fixed carbon content of 77 to 87%, and an ash content of 3 to 8%, all percentages being by weight on a dry basis.

2. A fuel briquette according to claim 1, wherein said fuel particles have a moisture content of up to 15%.

3. A fuel briquette according to claim 1 or 2, wherein said fuel particles have a sulphur content not exceeding 2%.

4. A fuel briquette according to any of claims 1 to 3, wherein said fuel particles have a chlorine

content not exceeding 1%.

5. A fuel briquette according to any of claims 1 to 4, wherein said fuel particles have a calorific value of 28,000 to 36,000 kJ/kg on a dry basis.

6. A fuel briquette according to any of claims 1 to 5, wherein said fuel particles have a particle size of not exceeding 22mm.

7. A fuel briquette according to any of claims 1 to 6, wherein said coal comprises dry steam coal.

8. A fuel briquette according to any of claims 1 to 6, wherein said coal comprises a blend of two or more of anthracite coal, coking coal, bituminous or semi-bituminous coal, lignite or petroleum coke.

9. A fuel briquette according to any of claims 1 to 8, which contains 0.05 to 3% by weight of one or more ash modification agents selected from iron oxide, magnesium sulphate and sodium orth-phosphate.

10. A briquetting process, which comprises mixing fuel particles comprising coal having a volatiles content of 10 to 14%, a fixed carbon content of 77 to 87%, and an ash content of 3 to 8%, all percentages being by weight on a dry basis, with a minor amount of a curable binder, forming the mix into briquettes, and allowing the binder to cure.

11. A briquetting process according to claim 10, wherein said fuel particles are as defined in any of claims 2 to 9.

12. A briquetting process according to claim 4 or 5, wherein said curing is carried out at a temperature in the range of 150-350 degrees Celsius.