CLAIMS

1. A fuel composition for combustion, the fuel composition comprising:

a hydrocarbon-based fuel; and

magnetite material comprising magnetite (Fe_3O_4),

wherein:

the magnetite material is in the form of powder with a size range from 1 nm – 5 mm;

the magnetite material is 0.125–80% wt of the fuel composition.

the magnetite material comprises at least 40% wt magnetite (Fe_3O_4);

the magnetite material comprises at least 25% wt iron (Fe), wherein the iron is present as both Fe^{2+} and Fe^{3+} ions, with the Fe^{2+} and Fe^{3+} ions being at least 10% wt of the iron;

the magnetite material comprises 0.001–1.5% wt silica (SiO_2) of at least nanometre size; and

the magnetite material is free of moisture.

2. The fuel composition as claimed in claim 1, wherein the magnetite material additionally comprises phosphate, pyrite (FeS2), alumina (Al2O3), titania (TiO2), Mn_3O_4, Cr_2O_3, V_2O_5, MgO, K_2O, SrO, Na_2O, ZrO_2, and/or BaO.

3. The fuel composition accordingly to claim 1, wherein the hydrocarbon-based fuel comprises one of more of:

coal, peat, lignite, slimes dam coal, charcoal, and/or anthracite;

a petroleum-based fuel comprising heavy fuel oil (HFO); and/or

biomass, wood or wood pellets, opportunity fuels, biofuels, and/or bitumen.

4. The fuel composition as claimed in claim 1, wherein the hydrocarbon-based fuel is a liquid, and the magnetite material is a suspension or sediment.

5. The fuel composition as claimed in claim 1, wherein the hydrocarbon-based fuel includes one or more of:

tyre-derived fuel;

plastic waste fuel;

waste oil;

fly-ash; and

recovered soot.

6. A candle comprising the fuel composition of claim 1, wherein:

the hydrocarbon-based fuel comprises a wax, paraffin wax, and/or stearic acid; and

the candle includes a wick, the wick and the hydrocarbon-based fuel both being involved in combustion.

7. A method of making the fuel composition as claimed in claim 1, the method including:

combusting the fuel composition;

recovering magnetite material from the combusted fuel composition; and

mixing the hydrocarbon-based fuel with the recovered magnetite material, thereby to make more of the fuel composition.

8. The method as claimed in claim 7, the method including cooling the recovered magnetite material for at least 1 hour at a temperature of at most 35°C after the combusting.

9. The method as claimed in claim 7, wherein:

the recovered magnetite material is a solid; and

the method includes processing the solid recovered magnetite material to produce the magnetite material by grinding it into a powder of less than 45 μm in size.

10. The method as claimed in claim 7, which further comprises mixing the recovered magnetite material with raw magnetite material which has not been previously combusted.

11. The method as claimed in claim 7, wherein the recovered magnetite material is applied to a top surface of the hydrocarbon-based fuel.

12. The method as claimed in claim 7, wherein recovering the magnetite material comprises subjecting it to a magnetic field using magnets.

13. A method of making the fuel composition as claimed in claim 1, the method including:

providing container or conduit made of the magnetite material;

providing the hydrocarbon-based fuel in the container or conduit; and

mixing some of the magnetite material from the container or conduit with the hydrocarbon-based fuel, thereby to make the fuel composition.

14. The method as claimed in claim 7, wherein:

the hydrocarbon-based fuel is at least partially gaseous;

the gaseous hydrocarbon-based fuel is fed into a fluidised bed formation;

the gaseous hydrocarbon-based fuel comprises one or more of CO_2, CO, SO_2, and/or NO.

15. A method of making the fuel composition as claimed in claim 1, where the magnetite material is bonded with the hydrocarbon fuel with a bonding agent comprising a resin and is made into pellet or ball structure.