SUMMARY OF THE INVENTION

In one aspect of the disclosure, there is provided a GCI fuel composition comprising a fuel blend having an initial boiling point in a range of about 26°C to about 38°C and a final boiling point in a range of about 193°C to less than 250°C, a density of about 0.72 kg/l to about 0.8 kg/l at 15°C, a research octane number of about 70 to about 85, and a cetane number of less than about 27, the fuel blend comprising a naphtha stream and a kerosene stream.

In another aspect of the disclosure, there is provided a method of making a GCI fuel composition comprising blending a naphtha stream and a kerosene stream to form a fuel blend having an initial boiling point in a range of about 26°C to about 38°C and a final boiling point in a range of about 193°C to less than 250°C, a density of about 0.72 kg/l to about 0.8 kg/l at 15°C, a research octane number of about 70 to about 85, and a cetane number of less than about 27.

BRIEF DESCRIPTION OF THE DRAWING

The Figure is an illustration of one embodiment of a refining process according the present invention.

DETAILED DESCRIPTION OF THE INVENTION

A new low octane fuel composition has been identified for use in GCI engines, as well as a refinery process to produce the new fuel composition. The GCI fuel composition has a wide boiling range from light naphtha to kerosene, a low RON, and a low CN, while meeting all other gasoline specifications for olefins, aromatics, and sulfur. The GCI fuel composition is injected earlier in the engine cycle compared to normal diesel fuel. Particulates and NOx can be far more easily controlled by using fuels with high ignition delay. The final boiling point (FBP) of the GCI fuel composition is higher than that of conventional gasoline, which provides more time for the fuel to mix with oxygen before combustion starts so that particulate formation can be minimized. This makes it easier to control NOx using EGR. Also, the injection pressure does not need to be as high as it is for CI engines (e.g., about 40-50 MPa); rather, it can be closer to the pressure of turbo-charged SI engines (e.g., about 15 MPa). Consequently, the after-treatment focus can be on the oxidation of hydrocarbons (HC) and CO rather than control of NOx and particulates. The efficiency if the GCI engine is at least as high as with conventional diesel combustion.