Utilization of fusel fuel as alternative fuels in SI engines

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Alternative fuels are becoming important due to higher energy demands with limited fuel supplies. Fuel efficiency and pollutant reduction are demanded by the combustion industry due to the high cost of fuel and also because of environmental regulations. Combustion is continuously predicted to be the most important method of generating energy for the next 30 years. High thermal efficiency combustion technology and alternative fuels produced from local feedstock are possible long-term solutions. The transport sector continues to account for a large share of humanity's total energy usage, and the road transport sector is characterized by near-total reliance on fossil fuels. A lot of efforts are currently going on worldwide to find alternative fuels which may meet our present and future demands for energy, without causing further global-warming effects. Alternative fuels that are currently in use and under consideration are all still carbon based.

The term 'alternative fuel' describes any fuel other than conventional fossil fuels that is used in the transportation sector. Fusel oil is a by-product obtained through the fermentation of some agricultural products such as beets, cones, grains, potatoes, sweet potatoes, rice and wheat. Fusel oil can be used as a clean and high-efficiency spark ignition fuel with a reduced NOx.

The octane number and density of fusel oil present the most important properties that make fusel oil as a candidate for an alternative fuel for SI fuel engines.