Opportunities for Biodiesel Compatibility as a Modern Combustion Engine Fuel

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ABSTRACT

This chapter summarizes the feasibility of effective utilization of biodiesel in modern, vehicle engines. The parameters discussed in this chapter include diesel engine characterization and diagnostics including performance, emissions, and combustion behavior. The lifecycle and economic analyses with future scope of biodiesel are also described. From the review, it is conferred that a huge proportion of biodiesel is produced from edible vegetable oils, which is a threat to the food supply. Biodiesel sources are focused upon non-edible oils and other feedstocks that do not compete with the food crops. Therefore, the selection of appropriate feedstock is essential to confirm the low-cost production of biodiesel. Concerning the engine characteristics and combustion diagnostics, it can be ensured that biodiesel improves engine performance and emission characteristics with little engine modifications such as injection timing, pressure, exhaust gas recirculation, etc. The review holds well on the possibility of using biodiesel in diesel engines, but still it is not economically viable and needs more research and technology advancements to make it competitive with other conventional fuels in the market.

KEYWORDS

Biodiesel; Transesterification; Greenhouse gas emissions; Engine performance; Non-edible oil

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