

Bio-based liquid fuels as a source of renewable energy: A review

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ABSTRACT

Limited availability of fossil fuels and their associated environmental impact during combustion remains the primary basis for exploring alternative energy sources such as bio-based liquid fuels. Several feedstocks have been used to produce biofuels for different applications with their own pros and cons. For instance, production of bio-fuels using human food chain raw materials such as corn, soy, peanut, and sugarcane are receiving increased criticism due to the competing demands of the same sources for human consumption as food. However, the non-food biomass in the form of agricultural wastes, municipal wastes, waste vegetable oil, and microbial sources are abundantly available that can be utilized as feedstock for production of biofuels. Because of this reason, most biofuels have been produced using the feedstocks that do not affect the food chain. Thus, in this work, the feedstocks of different generation biofuels and their potential yield and associated greenhouse gas emissions, production technologies are critically surveyed. Moreover, the application of biofuels for different purposes are analyzed and compared with their corresponding conventional fuels. The survey also points out the recent issues and challenges of biofuels with their resolution. The future research directions are suggested to sustain biofuel production.

Keywords: Biofuels, Feedstock generations Production technologies Engine performance Emissions