Fuel Properties of Corn Oil Biodiesel-Diesel Blends

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Biodiesel, one of green fuels and/or clean energies, is compatible with traditional petroleum-based diesel and both can be completely blended without any stratification. From the viewpoint of its chemical composition and properties, bio diesel fuels are biodegradable, low toxic, and emit less air pollutants than hydrocarbon-based diesel. However, the use of biodiesel shall face to its high cost relative to petroleum-based oils, and some problems related to the decrease power output and torque force and to the increase in NOx emissions with increasing bio diesel content in the blends. The disadvantages of vegetable oils as diesel fuel are higher viscosity, lower volatility, the reactivity of unsaturated hydrocarbon chains. The biggest difference between biofuels and petroleum feed stocks is oxygen content. Biofue\n
ls have oxygen levels from 10% to 45% while petroleum has essentially none making the chemical properties of biofuels very different from petroleum. Biodiesels can be completely miscible with petroleum dieselfuels, and are often used with fossil diesels as blends. The transesterification is the key and foremost important step to produce the cleaner and environmentally safe fuel from vegetable oils. This process has been widely used to reduce the high viscosity of triglycerides[1-3].

In the present study, commercially available diesel fuel was blended with the bio diesel prepared from corn oil. The blends (B10, B20, B30, B40, B50, B60, B70, B80, B90) were prepared on a volume basis. The basic properties of fatty acid methyl ester of corn oil – petroleum diesel fuel blends were measured according to the corresponding ASTM standards. Biodiesel was prepared from corn by transesterification of the crude oil with methanol in the presence of NaOH as catalyst[4]. The important properties of corn oil methyl ester (biodiesel)-diesel fuel blends such as density, kinematic viscosity, flash point, iodine number, neutralization number, pour point, cloud point, cetane number are found out and compared to those of no.2 petroleum diesel, ASTM and EN biodiesel standards.

References