Effect of n-butanol/diesel blends on performance and emissions characteristics of DI CI engine

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Abstract:

Fast depletion of the fossil fuel reserves is driving the research towards renewable fuels. Alcohols, which are produced from agricultural wastes such as sugarcane bagasse and corn stalks appear to be promising renewable fuels. Among the different alcohols, butanol which is a higher alcohol, is considered in the present study. The present paper discusses the performance and emission characteristics of a CI engine operating with butanol/diesel blends. Experiments were carried out with different butanol/diesel blends, with the butanol proportion in the blend varying from 0 to 40% percentage (by volume). The effect of butanol proportion in the butanol/diesel blends on the engine performance was studied numerically also, using CONVERGE CFD, an IC engine simulation software. The performance of the engine working with butanol/diesel blends was compared with performance of the engine operating with neat diesel. The performance of the engine was studied in terms of air-fuel mixture equivalence ratio, brake thermal efficiency and emissions.

Keywords: Butanol-diesel blends, CI engine, Diesel engine, Emissions and Performance.