

Performance and Emission Characteristics of Single Cylinder Diesel Engine Fueled with Organic Germanium

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Abstract:

The recent revolutionary progression in powder technology made the researchers explore for appropriate organic powder as a diesel additive with the purpose improve the performance and minimize the emission. An effort is made in this research to investigate the engine performance and emission characteristics of the 5, 8 and 10 mg concentration of organic germanium Ge-132, mixed with the diesel fuel. The single cylinder diesel engine set up was at constant full load and engine speeds from 1200 to 2400 rpm. The results show the brake power with all Ge-132-diesel fuel blends were increase due to its high energy content. The averages of brake power attained over the entire engine speed range were at 1.1% (DGe5), 2.2% (DGe8) and 3.7% (DGe10) higher than diesel fuel. However, significant reduction in BTE and increment of BSFC measured due to the thermophysical properties such as high density and kinematic viscosity of Ge-132-diesel fuel blends. The emission result showed the CO₂, NO_x and CO emissions for all mixtures slightly increase and HC emissions decreased at high speed due to the spray quality of the fuel.

Keywords: Combustion; Organic Germanium; Diesel Fuel, Cetane Improver; Engine Performance; Emission.

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