

Fish Oil and Its Methyl Ester as an Alternate Fuel in the Direct Injection Diesel Engine

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Abstract : Mackerel Fish oil was used as the raw material to produce the biodiesel in this study. The raw oil (RO) was collected from discarded fish products. This oil was filtered and heated to 110°C and made it moisture free. The filtered and moisture free RO was transesterified to produce biodiesel. The experimental results showed that oleic acid and lauric acid were the two major components of the fish oil biodiesel (FOB). Palmitic acid and linoleic acid were found approximately same in the quantity. The fuel properties kinematic viscosity, flash point, fire point, specific gravity, calorific value, cetane number, density, acid value, saponification value, iodine value, cloud point, pour point, ash content, Cu strip corrosion, carbon residue, API gravity were determined for FOB. A comparative study of the properties was carried out with RO and Neat diesel (ND). It was found that Cetane number was 59 for FOB which was more than RO, which showed 57. Blends (B20, B40, B60, B80: example: B20: 20% FOB + 80% ND) of FOB and ND were prepared on volume basis and comparative study was carried out with ND and FOB. Performance parameters BSFE, BSEC, A:F Ratio, Break thermal efficiency were analyzed and it was found that complete replacement of neat diesel (ND) is possible without any engine modifications.

Keywords : fish oil biodiesel, raw oil, blends, performance parameters

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