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**Effect of CeO2 nano powder as additive in WME-TPO blend to control toxic emissions from a light-duty diesel engine – An experimental study**

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**Abstract**

In diesel engines, waste cooking oil that obtained from the restaurant has been reused efficiently by mixing alcohols for having it less viscous and dense, despite transesterification or preheating to biodiesel. This framework made an attempt to develop an alternate for diesel with Waste cooking oil Methyl Ester (WME) by adding Tyre Pyrolysis Oil (TPO) and Cerium oxide (CeO2) as a reuse fuel. For this objective, five blends are prepared W50T50CeO2100, W60T40CeO2100, W70T30CeO2100, W80T20CeO2100 and W90T10CeO2100 and analyzed regarding the emission and performance characteristics. From the result, it was obvious that this alternate blended fuel that used on the engine at the whole load spectrum has increased greenhouse emission (NOx), whereas attains lesser emission in smoke, CO2, CO and HC emission than diesel. By the addition of these biodiesels i.e. WME with TPO and CeO2, the BTHE poses an improved performance on entire loads yet still maintains lower regarding diesel. Subsequently, the SFC has enhanced performance when compared over diesel fuels. Hence, the harmful emissions and fossil fuel dependence can be reduced effectively by our proposed blended biodiesel fuels, and thereby makes the environment hazards free from contaminating the land and water resources.

**Keywords:**

Biodiesel, Biodiesel blending, Waste cooking oil, Tyre pyrolysis oil, Cerium oxide, Transesterification

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