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Feasibility Evaluation and Numerical Simulation of Diesel–Diethyl Ether–2–Methoxy Ethyl Ether Blends Fueling in Stationary CI Engine

Mukesh Kumar, Chandan Kumar, Umesh Kumar Das and Sumit Sharma

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Abstract

In many developed economies, the diesel engine is very important for transportation and farming. There is a lot of research being done in the field of renewable energy to replace conventional energy sources because of the major environmental issues and the rising expense of diesel. Diesel engine cannot be reinstate because of its efficient performance at higher power and reliability with alternative engines. Diesel engine emissions are very harmful to the atmosphere and human health. The main contaminants in diesel engines are smoke and NOx, which need to be effectively monitored. A numerous research is going on to diminish the emissions from CI engines by using some additives as well as the use of alternative fuels. This

experimental inquiry was conducted to identify a suitable addition to lower exhaust emissions and improve CI engine performance. The trials used various mix ratios of pure diesel and blends of diesel and diethyl ether-2-methoxy ethyl ether. Mixing of 5% DEE and 5% MXEE with 90% diesel on volume basis (D90–DEE5–MXEE5) showed optimum results of emission and performance. Low exhaust emissions (HC 63.15%, CO 60.00%, and Smoke 18.29%) found to be substantial at peak loads and performance increase (decreasing in BSFC 5.00% and increasing in BTE 3.00%) were compared to mixture D90-DEE5-MXEE5 with diesel (at standard engine conditions). However, NOx rises (2.60%).

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