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Effect of Exhaust Gas Recirculation on the Performance and Emissions of a Common Rail Diesel Engine Powered by B20 Mix Waste Cooking Oil Methyl Ester Using CFD

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Abstract

Internal combustion engines (IC engines) are broadly applied in goods and people transportation, as well as agricultural and industrial activities. The most widely recognized biodiesel mix is B20, 20% biodiesel is mixed with diesel. Many diesel vehicles can operate on B20 and relatively low blends without requiring any engine change. A number of computational fluid dynamics (CFD) assessments have also been performed since they have shown to be a beneficial tool in aiding with experimental work. A CFD Analysis of a Toroidal re-entrant combustion chamber (TRCC), 17.5 CR, Injection timing 10° BTDC and Injection pressure 900 bar with 0.2 mm dia 8 holes injector 4 stroke CRDI engine with WMCO biodiesel–diesel blends result is well accord with the experimental result. Further CFD analysis is carried out for different EGR rate for NO_x reduction. The indicated thermal efficiency and indicated power are obtained constant for different EGRs. As percentage of

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