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Experimental Investigation of Performance and Emission Characteristics of Using Acetylene Gas in CI Engine

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Abstract : Studies reveal that acetylene gas derived from hydrolysis of calcium carbide has similar properties to that of diesel. However, the self-ignition temperature of acetylene gas is higher than that of diesel. Early investigations reveal that acetylene gas could be used as alternative fuel mode. In the present work, acetylene gas of 31/min were inducted and diesel was injected into the combustion chamber of a single cylinder air cooled diesel engine. It was observed that the higher calorific value of acetylene gas improves the brake thermal efficiency at full load conditions. The CO and HC emissions were higher at part load conditions as compared to conventional diesel. The Nox emission level was higher and smoke emission was lower during dual fuel mode under all operating conditions. It is concluded that dual fuel mode of acetylene gas and diesel improves the brake thermal efficiency and reduces smoke in diesel engine.

Keywords : acetylene gas, diesel engine, Nox emission, CO emission, HC emission
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