

(54) Title of the invention : ANALYSIS OF A DIESEL ENGINE USING TERMINALIA BELLIRICA SEED OIL AS BIOFUEL AND NANOFUEL SOURCE.

<p>(51) International classification :F02B0075040000, F02D0035020000, C10L0001182000, F02B0003060000, C10L0001230000</p> <p>(86) International Application No :NA Filing Date :NA</p> <p>(87) International Publication No : NA</p> <p>(61) Patent of Addition to Application Number :NA Filing Date :NA</p> <p>(62) Divisional to Application Number :NA Filing Date :NA</p>	<p>(71)Name of Applicant :</p> <p>1)Dr.Prakasa Rao Jonnakuti Address of Applicant :Department of Botany, Andhra University College of Science and Technology, Andhra University, Visakhapatnam, India, 530003 -----</p> <p>2)Dr. Jai Kumar Sagari 3)Mrs. Chandravathi Dibba 4)Janaki Rao Pujari 5)Dr.Sheik. Hidayatulla Shariff 6)Dr.SalauguBodayyaPadal</p> <p>Name of Applicant : NA Address of Applicant : NA</p> <p>(72)Name of Inventor :</p> <p>1)Dr.Prakasa Rao Jonnakuti Address of Applicant :Department of Botany, Andhra University College of Science and Technology, Andhra University, Visakhapatnam, India, 530003 -----</p> <p>2)Dr. Jai Kumar Sagari Address of Applicant :Department of Mechanical Engineering, GITAM Scholl of Technology, GITAM (Deemed to be University), Visakhapatnam, India,530045 ---</p> <p>3)Mrs. Chandravathi Dibba Address of Applicant :Department of Botany, Andhra University College of Science and Technology, Andhra University, Visakhapatnam, India, 530003 -----</p> <p>4)Janaki Rao Pujari Address of Applicant :Government Degree College, K. Perumallapuram, India, 533449 -----</p> <p>5)Dr.Sheik. Hidayatulla Shariff Address of Applicant :Department of Mechanical Engineering, Avanthi Institute of Engineering and Technology, Vizianagaram, India, 531 162 -----</p> <p>6)Dr.SalauguBodayyaPadal Address of Applicant :Department of Botany, Andhra University College of Science and Technology, Andhra University, Visakhapatnam, India, 530003 -----</p>
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(57) Abstract :

ABSTRACT The current study seeks to assess the combustion, performance, and emission characteristics of a variable compression ratio (VCR) compression ignition engine powered by a biodiesel mix of ZnO nanoparticles and Baheda (*Terminalia bellirica*) oil (BOBD20). ZnO nanoparticles were examined at three distinct concentrations: 50, 75, and 100 ppm. A dispersion of ZnO nanoparticles was also created by combining them with a dispersant (QPAN80) at a 1:1 ratio. The study contained four compaction ratios, which were employed throughout the investigation: 16.5:1, 17.5:1, 18.5:1, and 19.5:1. ZnO nanoparticle dispersion in BOBD20 produced remarkable results. When compared to normal diesel and biodiesel, the usage of dispersant-added fuel produced better outcomes. In terms of operational characteristics, BOBD20+ZnO75 + DSP 75 outperformed the other alternatives. Furthermore, when the compression ratio was raised, a great improvement was noted, and significant results were attained at a compression ratio of 19.5:1. At a compression ratio of 19.5:1, the fuel blend BOBD20+ZnO 75 + DSP 75 had the maximum thermal efficiency (BTE) of 34.89% and the lowest brake specific fuel consumption (BSFC) of 0.305 kg/kWh. Maximum combustion rates, such as heating power (CP) and net heat release rate (NHRR), were also measured at 72.52 bar and 61.22 J/oCA, respectively. The minimal emissions of carbon monoxide (CO), unburnt hydrocarbons (UHC), and oxides of nitrogen (NOx) in the case of BOBD20+ZnO75 +DSP75 were 0.08%, 25 parts per million (ppm), and 932 ppm, respectively.

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