EuroSciCon

Annual Summit on
Renewable & Sustainable Energy

August 13-14, 2018
Paris, France

Gokul Raghavendra Srinivasan et al., Trends in Green chem 2018, Volume: 4
DOI: 10.21767/2471-9889-C1-009

DEVELOPMENT OF JET TURBINE BASED BIO-KEROSENE USING WASTE BEEF TALLOW AS FEEDSTOCK

Gokul Raghavendra Srinivasan[1], Ranjitha Jambulingam[2]

[1]Research Scholar, CO_2 Research and Green Technologies Centre, Vellore Institute of Technology, Vellore, Tamil Nadu, India

[2]Assistant Professor, CO_2 Research and Green Technologies Centre, Vellore Institute of Technology, Vellore, Tamil Nadu, India

Sustainable biofuels have been considered as a robust option among aviation industries for reducing the carbon footprint in future. One such biofuel is bio-kerosene produced from waste beef tallow that was extracted from discarded wastes found in animal slaughter houses and leather tanneries. This biofuel was produced by thermal cracking of transesterified tallow (tallow based biodiesel) in fractional distillation column for converting it into highly volatile jet fuel. Maximum fat content in the discarded wastes were found to be 75% and the optimum amount of tallow that can be recovered from those wastes was 83%. The extracted tallow was transesterified using ethanol as solvent in a molar ratio of 1:3 whereas potassium hydroxide of 0.5% weight of tallow was taken as base catalyst. Produced biodiesel was thermally cracked in distillation column at a temperature of 120°C producing a yield of 76.8 wt% of tallow based biodiesel taken. The synthesized bio-kerosene was tested for its physicochemical properties in comparison with Jet A1 fuel based upon the ASTM D1655 standards. The combustion and performance study revealed that the static thrust was found to be similar to that of Jet A1 fuel whereas thrust specific fuel consumption and thermal efficiency slightly deviated on varying operating speed. Turbine inlet and exhaust gas temperatures varied accordingly at entry and exit condition depending upon the turbine speed for both fuels. The COX and NOX emissions were also found to be in acceptable range in comparison with Jet A1 fuel.

Biography

Gokul Raghavendra Srinivasan, Research Scholar, CO_2 Research and Green Technologies Centre ,VIT University is currently working in field of Bioenergy and has expertise in production and molecular analysis of biodiesel. He has sound knowledge in Bioenergy Sciences, Quantum Computational Chemistry and is presently working on the same field for his PhD work. As an under graduate in Mechanical engineering, he has good knowledge in Power plants and internal combustion engines. Specialized as energy and environmental engineer, he exhibits his expertise in Renewable Energy Resources, Energy Conservation and Management, Waste Water Treatments and Bio-Remediation Techniques. Mr.GR Srinivasan has a year of research experience in renowned research institute under the guidance of eminent scientist. He along with his guide has published 4 international journals and has presented two papers in international conferences. Currently, he is serving as a reviewer in Brazilian journal of chemical engineering, Journal of Environmental Science and Technology. Mr.GR Srinivasan has graduated his bachelor's degree in 2014 in affiliation with Anna University, Chennai whereas VIT University, Vellore awarded his Master's degree in 2016. He is an active member in Society of Automobile Engineers (SAE INDIA) and has participated in various activities conducted by them. He has been working in the area of biodiesel production for past 8 years using various waste oils and fats.

gokusrinivasan@gmail.com