J Fundam Renewable Energy App 2016, 6:6(Suppl)
http://dx.doi.org/10.4172/2090-4541.C1.021

Fuel quality of biodiesel from *Chlorella protothecoides* microalgae species

M P Sharma and **Mukesh Kumar**
Indian Institute of Technology Roorkee, India

Depleting fossil fuel resources coupled with serious environmental degradation has led to the search for alternative resources for biodiesel production as a substitute of petro-diesel. Currently, edible, non-edible oils and microalgal plant species are cultivated for biodiesel production. Looking at the demerits of edible and non-edible oil resources, the focus is being given to grow microalgal species having high oil productivities, less maturity time and less land requirement. Out of various microalgal species, *Chlorella protothecoides* is considered as the most promising species for biodiesel production owing to high oil content (58 %), faster growth rate (24–48 h) and high biomass productivity (1214 mg/l/day). The present paper reports the results of optimization of reaction parameters of transesterification process as well as the kinetics of transesterification with 97% yield of biodiesel. The measurement of fuel quality of microalgal biodiesel shows that the biodiesel exhibit very good oxidation stability (O.S) of 7 hrs, more than ASTM D6751 (3 hrs) and EN 14112 (6 hrs) specifications. The CP and PP of 0 and -3°C are finding as per ASTM D 2500-11 and ASTM D 97-12 standards. These results show that the microalgal biodiesel does not need any enhancement in O.S & CFP and hence can be recommended to be directly used as MB_{100} or its blends into diesel engine operation. Further, scope is available for the production of binary blends using poor quality biodiesel for engine operation.

mukeshdce07@gmail.com

New insight into the synthesis of biological waste derived economical catalyst: A catalytic performance study for the preparation of biodiesel

Mehulkumar L Savaliya[1], **Mathurkumar S Bhakhar**[2] and **Bharatkumar Z Dholakiya**[1]
[1]Sardar Vallabhbhai National Institute of Technology, India
[2]G H Patel College of Engineering and Technology, India

In current exploration, a newer egg shell derived catalyst (ESDC) was prosperously developed by calcination of egg shell powder and exercised to the transesterification of *Helianthus annuus L* oil respecting production of biodiesel. The superlative biodiesel (%) yield was observed up to 99.2%. Synthesized egg shell derived catalyst affirmed remarkable catalytic activity for transesterification of *Helianthus annuus L* oil with 2.5% catalyst dose (*w/w*). ESDC was deservedly characterized by FT-IR, XRD, BET, TPD-CO_2, TGA and SEM analysis. While, *Helianthus annuus L* oil and biodiesel were punctually characterized by FT-IR, as well as ^1H and ^{13}C NMR were done by spectroscopic techniques. As an evidenced of the experimental results, the optimal reaction conditions within the stipulated framework were found to be, 65°C reaction temperature, 2 h reaction time, 2.5% catalyst loading and 1:8 *Helianthus annuus L* oil to methanol molar ratio, obtaining maximal biodiesel (%) yield.

msmehulsavaliya@gmail.com