

Efficiency of Pre-Treatment Methods for Biodiesel Production from Mixed Culture of Microalgae

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Abstract : The rapid depletion of fossil fuel supplies and the emission of carbon dioxide by their continued combustion have paved the way for increased production of carbon-neutral biodiesel from naturally occurring oil sources. The high biomass growth rate and lipid production of microalgae make it a viable source for biodiesel production compared to conventional feedstock. In Sri Lanka, the production of biodiesel by employing indigenous microalgae species is at its emerging stage. This work was an attempt to compare the various pre-treatment methods before extracting lipids such as autoclaving, microwaving and sonication. A mixed culture of microalgae predominantly consisting of *Chlorella* sp. was obtained from Beire Lake which is an algae rich, organically polluted water body located in Colombo, Sri Lanka. After each pre-treatment method, a standard solvent extraction using Bligh and Dyer's method was used to compare the total lipid content in percentage dry weight (% dwt). The fatty acid profiles of the oils extracted with each pretreatment method were analyzed using gas chromatography-mass spectrometry (GC-MS). The properties of the biodiesels were predicted by Biodiesel Analyzer© Version 1.1, in order to compare with ASTM 6751-08 biodiesel standard.

Keywords : biodiesel, lipid extraction, microalgae, pre-treatment

Conference Title : ICEMBB 2018 : International Conference on Energy Management, Biofuels and Biorefining

Conference Location : Mumbai, India

Conference Dates : February 22-23, 2018