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In-situ biodiesel production from wet *Chlorella vulgaris* under subcritical conditions

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The conventional base catalyzed biodiesel production process uses refined vegetable oil as feedstock oil and is not environmentally friendly. The supercritical methanol technology does not require the use of catalyst but it is energy intensive due to the high temperature and pressure required in the process. In this work, a process was developed for producing biodiesel directly from wet *Chlorella vulgaris* biomass (80% moisture content) using subcritical water as catalyst. Under the following conditions: The ratio of wet biomass to methanol is 1/4 (g/mL), the reaction temperature is 175 °C and after 4 h, the reaction product contained 89.71% fatty acid methyl esters (FAMEs). The yield is 0.29 g FAME per g dry biomass. This is considerably higher than the yield of 0.20 g FAME per g dry biomass obtained when the neutral lipid of *C. vulgaris* biomass was extracted and converted into FAME.

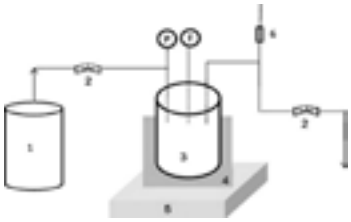

Figure.1: Schematic diagram of reactor set-up: (1) nitrogen cylinder, (2) needle valve, (3) reactor, (4) electric heater, (5) magnetic stirrer plate, (6) safety valve, (p) pressure gauge, (t) thermocouple.

Biography

Yeshitila Asteraye Tsigie has PhD in Applied Chemistry from National Taiwan University of Science and technology. He has his expertise in biofuels research. Biodiesel and bioethanol research have has been the focus of his research thematic area. He has conducted works on Biodiesel from yeasts and algae. Chlorella vulgaris was one of these microorganisms wherein the biodiesel research was undertaken.

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