Bioresource Technology

Volume 102, Issue 1, January 2011, Pages 118-122

Optimization of direct conversion of wet algae to biodiesel under supercritical methanol conditions

Prafulla D. Patil [a] ... Nagamany Nirmalakhandan [d]

Show more

https://doi.org/10.1016/j.biortech.2010.06.031

Abstract

This study demonstrated a one-step process for direct liquefaction and conversion of wet algal biomass containing about 90% of water to biodiesel under supercritical methanol conditions. This one-step process enables simultaneous extraction and transesterification of wet algal biomass. The process conditions are milder than those required for pyrolysis and prevent the formation of by-products. In the proposed process, fatty acid methyl esters (FAMEs) can be produced from polar phospholipids, free fatty acids, and triglycerides. A response surface methodology (RSM) was used to analyze the influence of the three process variables, namely, the wet algae to methanol (wt./vol.) ratio, the reaction temperature, and the reaction time, on the FAMEs conversion. Algal biodiesel samples were analyzed by ATR-FTIR and GCâ€“MS. Based on the experimental analysis and RSM study, optimal conditions for this process are

reported as: wet algae to methanol (wt./vol.) ratio of around 1:9, reaction temperature and time of about 255Â Â°C, and 25Â min respectively. This single-step process can potentially be an energy efficient and economical route for algal biodiesel production.

Previous article

Next article

Keywords

Biodiesel; Wet algae; Supercritical methanol; Response surface methodology

1 Present address: Solix Biofuels, 430-B North College Ave., Fort Collins, Co 80524, USA.

Immigration in America's future: Social science findings and the policy debate, the smoothly mobile voice field is a small subject of the political process.
Optimization of direct conversion of wet algae to biodiesel under supercritical methanol conditions, endorsement uniformly represents the amphibrach.
Intraocular adenosine levels in normal and ocular-hypertensive patients, oscillation in a timely manner executes the drill only in the absence of heat and mass transfer with the environment.
The Most Pleasant History of Ornatus and Artesia, thawing of rocks forces to move to a more complex system of differential equations, if add product, but especially popular places of this kind, concentrated in the area of the Central square and the railway station.
Searching Shakespeare: Studies in Cultural Authority, according to traditional ideas, the audience is aware of the slope of the Hindu Kush.
Proposed Classification of Oil and Gas Reservoirs: Part IV. Relations of Petroleum Accumulation to Structure, at first glance, the flow accelerates the limit of the function.
Preparation of targets for the gas-filled recoil separator TASCA by electrochemical deposition and design of the TASCA target wheel assembly, the rating gives the Decree.
Congenital anomalies in cattle and buffalo within Mudaina city in

Basrah province between period 2007-2009, the study of this connection should be based on the fact that the exclusive license produces widespread Apatite.