

Wet Extraction of Lutein and Lipids from Microalga by Quantitative Determination of Polarity

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Abstract : Harvesting by-products while recovering biodiesel is considered a potentially valuable approach to increase the market feasibility of microalgae industry. Lutein is a possible by-product from microalgae that promotes eye health. The extraction efficiency and the expensive drying process of wet algae represent the major challenges for the utilization of microalgae biomass as a feedstock for lipids, proteins, and carotenoids. A wet extraction method was developed to extract lipids and lutein from microalga *Chlorella vulgaris*. To evaluate different solvent (mixtures) for the extraction, a quantitative analysis was established based on the polarity of solvents using Nile Red as the polarity (ETN) indicator. By the choice of binary solvent system then adding proper amount of water to achieve phase separation, lipids and lutein can be extracted simultaneously. Some other parameters for lipids and lutein production were also studied including saponification time, temperature, choice of alkali, and pre-treatment methods. The extraction efficiency with wet algae was compared with dried algae and shown better pigment recovery. The results indicated that the product pattern in each extracted phase was polarity dependent. Lutein and β -carotene were the main carotenoids extracted with ethanol while lipids come out with hexane.

Keywords : biodiesel, *Chlorella vulgaris*, extraction, lutein

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