

## Simultaneous Extraction and Reaction For the Production of Biodiesel From Microalgae

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Microalgae have become an important source of biodiesel due to their high lipid productivity. Downstream processes for biodiesel production include extraction and transesterification. Because extracting lipids from wet microalgae does not presently provide desirable results, the extraction step needs an additional drying process which is quite energy-intensive. Thus, developing an efficient process for lipid extraction from wet microalgae is a major issue for industrial applications. This work presents a reliable and compact process which integrates lipid extraction from wet microalgae, and its conversion to biodiesel, with a yield higher than 90 wt.%. This process enables single-step production of biodiesel from microalgae by mixing wet microalgal cells with a solvent (e.g., chloroform, toluene, or hexane), methanol and an acid catalyst; and then heating them in one pot. This simultaneous extraction and transesterification of wet microalgae enables a dramatic reduction in energy consumption for the drying process and enables the economic production of biodiesel using microalgae.