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## Artificial crude oil production using halotolerant microalgae

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### Summary

The origin of petroleum is considered to be “kerogen”, which was formed from sea sediments including algal biomass under high pressure and at a high temperature. When we think of oil crisis in future, which will be surely caused by rapid increase of energy consumption accelerated by economic growth and a population explosion, it is beneficial to examine a possibility of producing crude oil from renewable resources by a mimetic approach based on a mechanism of natural kerogen generation. In this study artificial crude oil production from halotolerant microalgae *Dunaliella tertiolecta* was investigated. *D. tertiolecta* was successfully cultivated under high saline condition and accumulated intracellular glycerol. The cells were effectively harvested from culture broth by increasing pH to around 8.5-10.5. The harvested cells were then thermo-chemically liquefied under the conditions of 250°C and 50 kg/cm<sup>2</sup>, which generated crude oil-like product with a calorific value of 6-7,000 cal/g.



Photobioreactor for algal biomass production



Cell harvesting by pH regulation



Crude oil-like product generated by thermal treatment of algal biomass

Artificial crude oil production from halotolerant microalgae