

Direct Extraction from Concentrated Microalgal Culture Using Osmotic Shock for Biodiesel Production

유거송, 박원근, 김철웅, 양지원*
KAIST
(jiwonyang@kaist.ac.kr*)

Biodiesel from microalgae is a proven alternative of petroleum for future transportation fuel. It can solve fossil fuel depletion problem as well as global warming because microalgae mitigate carbon dioxide for growth and lipid accumulation. However, conventional lipid extraction from microalgae suffers high energy input as it requires dry biomass, and otherwise extraction efficiency is reduced. Drying of microalgae costs so much energy that biodiesel from microalgae cannot gain economic viability unless it is eliminated. Therefore, this research aims to apply osmotic shock to 10 times concentrated microalgal biomass, which is equivalent to just harvested microalgae using economical means such as flocculation or floatation, to enhance wet lipid extraction efficiency (lipid recovery). Effects of genetic cell wall removal and co-solvent ratio were also investigated. As the result, osmotic shock combined with co-solvent system could enhance the extraction efficiency by more than 2~3 times, and it turned out genetic cell wall removal plays a great roll in extraction process.