

Techno-economic analysis of volatile fatty acids recovery and production from brown algae using membrane distillation

Peyman Fasahati, 유 준\*

부경대학교

(jayliu@pknu.ac.kr\*)

Volatile fatty acids (VFA) are promising biofuel precursors that can be processed to produce mixed alcohols or other biofuels. This study evaluates the economy of production and separation of VFAs as products of anaerobic digestion (AD) of brown algae. Membrane distillation (MD) was integrated to product recovery unit to increase the VFA concentration from 3 % to 10 % in fermentation broth. The process is simulated in Aspen Plus v8.4 and a techno-economic model were developed to calculate minimum VFA selling price. The results showed profitability of using membrane distillation to lower the utility and operation costs of VFA recovery. A minimum VFA selling price of 384 \$/t were calculated for base case. The lower cost obtained for VFA production in this study makes brown algae a reliable candidate for VFA and subsequent biofuel production processes.