

Energy, economic, and environmental assessment of MixAlco® routes for mixed alcohols production from Seaweed

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This study performs the energy efficiency, economic, and environmental assessment of two MixAlco® routes for mixed alcohols production from seaweed. In the first route, ammonium bicarbonate is used to produce ammonium carboxylate salts which are later dewatered, esterified, and hydrogenated to alcohols. In the second route, calcium carbonate is used to produce carboxylate salts which are later dewatered, thermally converted to ketones, and hydrogenated to alcohols. Aspen Plus v.8.6 was used to rigorously simulate the processes. Results of simulation were used to evaluate the energy efficiency and develop techno-economic models to assess the economics of each process. In addition, CO₂ emissions of each route were calculated using the methodology defined by US environmental protection agency. Results show that the second route is advantageous over the first route in terms of energy efficiency, economics, and CO₂ emissions.