Improving the revenue of lignocellulosic biofuels: An integrated strategy for coproducing liquid transportation fuels and chemicals

김현우, 원왕연†
창원대학교
(wangyunwon@gmail.com†)

We propose a biorefinery strategy for the coproduction of liquid hydrocarbon fuels and chemicals from lignocellulosic biomass. In our strategy, all three primary components of biomass are converted into high-value products that can be commercialized: (1) cellulose, which is converted into butene oligomers for transportation; (2) hemicellulose, which is converted into 1,5-pentanediol, which can be used as polyester and polyurethane component; and (3) lignin, which is converted into carbon products (e.g., carbon fibers or batter anodes), thereby maximizing the biomass utilization (up to 47% of the biomass to useful products) and leading to an increase in economic feasibility. Our technoeconomic analysis shows that the integrated strategy leads to a minimum selling price of $3.02 per gallon of gasoline equivalent for butene oligomers, which suggests that it is a promising alternative to current biofuels production approaches.