Optimal Processing Pathway for Microalgal Biorefinery based on *Nannochloropsis sp*

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In this study, a superstructure based optimization model of microalgae-based biorefinery is proposed. The proposed biorefinery superstructure is based on Nannochloropsis sp. and it consists of major processing steps for the biofuels production such as cultivation, harvesting of biomass, pretreatment of harvested biomass, extraction of lipids from biomass, transesterification, post-transesterification, and microalgae residue conversion. The mixed integer nonlinear programming (MINLP) model is formulated to find the optimal process option in each processing step among the various potential technological alternatives available for the production of biofuels from microalgae. The proposed MINLP model is solved by applying on a specific case with different objective functions. The results showed the optimal configuration of biorefinery depending on the implemented objective function.