

Toward a Computer-Aided Synthesis and Design of Biorefinery Networks: Data Collection and Management Using a Generic Modeling Approach - DTU Orbit (09/11/2017)

Toward a Computer-Aided Synthesis and Design of Biorefinery Networks: Data Collection and Management Using a Generic Modeling Approach

Recent research into biorefineries resulted in many competing concepts and technologies for conversion of renewable biobased feedstock into an array of promising products including fuels, chemicals, materials, etc. The topic of this study is collection and management of the complex biorefinery data that are needed among others to support the superstructure-based optimization studies. To this end, we first formulate an integrated thermochemical and biochemical biorefinery superstructure and then use a generic modeling approach to represent each processing technology in the superstructure. The generic model parameters includes reaction yield, utility consumption, and separation efficiency among others, which are identified on the basis of input-output data (generated from rigorous models) collected from detailed biorefinery case studies reported in the open literature. The outcome is a verified database for the extended biorefinery networks combining thermochemical and biochemical platforms that represents 2882 potential biorefinery routes. The validated biorefinery database is made public and can be used to cross-validate and benchmark new biorefinery technologies and concepts as well as in superstructure-based optimization studies.

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