



8th ICGC 2018 Session:

Integration of biorefinery concept for development of sustainable process for pulp and paper industry

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Abstract:

This presentation focuses on integration of biorefinery concept to the existing pulp and paper process for development of sustainable process for the pulp and paper industry. A systematic methodology employed was based on superstructure-based process synthesis approach. The potential pathways were defined for a long-term sustainable growth based on the developed superstructure of the multi-product biorefinery process with the existing pulp mill. The superstructure involves three main sections; chemical pulping process, biochemical production and black liquor utilization. Eucalyptus wood and bagasse were employed as raw materials of the process. To improve process efficiency and profitability, ethanol, succinic acid, lactic acid, DME and extracted lignin were considered as the potential bioproducts along with the conventional pulp and paper production. Superstructure optimization was performed to determine optimal integrated networks with maximum profit for three scenarios. First, pulp pathway was traded-off between paper production and one of biochemical production. Further, optimal networks for multi-products were figured out in the second and third scenarios. The obtained results reveal the promising integrated networks for process design and innovation stages for the sustainable biorefinery-integrated pulp and paper process.

References:

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Dr. Suttichai was born in 1970. He received his Bachelor Degree in Chemical Engineering from Chulalongkorn University and his M.Sc. and Ph.D. from Imperial College London. His research interest is on multifunctional reactors and process intensification. He received several awards such as Outstanding Researcher Award from the National Research Council of Thailand and PTIT AWARD (Fellow) from Petroleum Institute of Thailand.

