

Design and Control of an Integrated Plant for Simultaneous Production of γ -Butyrolactone and 2-Methyl Furan

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Abstract : The design and plantwide control of an integrated plant where the endothermic 1,4-butanediol dehydrogenation and the exothermic furfural hydrogenation is simultaneously performed in a single reactor is studied. The reactions can be carried out in an adiabatic reactor using small hydrogen excess and with reduced parameter sensitivity. The plant is robust and flexible enough to allow different production rates of γ -butyrolactone and 2-methyl furan, keeping high product purities. Rigorous steady state and dynamic simulations performed in AspenPlus and AspenDynamics to support the conclusions.

Keywords : dehydrogenation and hydrogenation, reaction coupling, design and control, process integration

Conference Title : ICACCBE 2015 : International Conference on Applied Chemistry, Chemical and Biomolecular Engineering

Conference Location : Barcelona, Spain

Conference Dates : February 26-27, 2015