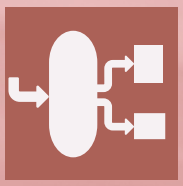

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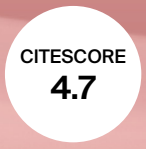

Section

Chemical Processes and Systems

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Prof. Dr. Blaž Likozar

Section Information

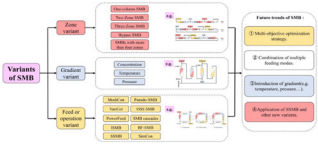
The Chemical Processes and Systems section of the *Processes* journal is the ideal forum for publication of significant high-excellence and high-impact research, as well as reviews. What we mean by 'Chemical Systems' and what is expected in terms of content should be, to a certain extent, self-explanatory; nevertheless, it should be clarified that our definition is distinct from pure discipline and capacity-based chemical and chemical engineering papers in the following ways: Complexity might be the key asset. In this sense, papers submitted should embrace, for example, a systems view as given in chemical system engineering, a holistic view as given in process design development, or an interdisciplinary view as given when disciplines meet challenges by sustainability or green chemistry. The nature of the investigations is at best symbiotic and/or disruptive, which means they have the potential to transform science and industry. Both fundamental investigations and industrial showcases are of interest in this section. All manuscripts submitted for publication under this section will undergo the usual high-quality peer review process of the *Processes* journal and, if accepted, will be published rapidly online.

Selected Papers

DOI:10.3390/pr11020508

Research Progress on the Typical Variants of Simulated Moving Bed: From the Established Processes to the Advanced Technologies

Authors: Xiaotong Zhang, Juming Liu, Ajay K. Ray and Yan Li

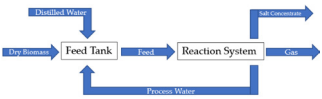


Abstract: Simulated moving bed (SMB) chromatography is a highly efficient adsorption-based separation technology with various industrial applications. At present, its application has been successfully extended to the biochemical and pharmaceutical industrial sectors. SMB possesses the advantages of high product purity and yield, large feed treatment capacity, and simple process control due to the continuous operation mode and the efficient separation mechanism, particularly for difficult separation. Moreover, SMB performs well, particularly for multi-component separation or complicated systems' purification processes in which each component exhibits similar properties and low resolution. With the development of the economy and technology, SMB technology needs to be improved and optimized to enhance its performance and deal with more complex separation tasks. This paper summarizes the typical variants or modifications of the SMB process through three aspects: zone variant, gradient variant, and feed or operation variant. The corresponding modification principles, operating modes, advantages, limitations, and practical application areas of each variant were comprehensively investigated. Finally, the application prospect and development direction were summarized, which could provide valuable recommendations and guidance for future research in the SMB area.

DOI:10.3390/pr11030797

Process Effluent Recycling in the Supercritical Water Gasification of Dry Biomass

Authors: Julian Dutzi, Nikolaos Boukis and Jörg Sauer



Abstract: The influence of process water recycling during the Supercritical Water Gasification (SCWG) of dry biomasses was investigated. Dry biomass has to be diluted with water to a dry matter content of approximately 10 wt.% to gasify it in the process of supercritical water gasification. The treatment of wastewater in the SCWG process is cost intensive due to organic contaminants; therefore, the recycling of the process effluent is attractive. Salt separation is needed to avoid accumulation of salts in the effluents, since salts enhance corrosion rates and might cause blocking of the flow when the effluent is recycled. The grass Reed Canary Grass and grapevines were gasified. The recycling of the process effluent did not influence the composition of the product gas. In both cases the carbon efficiency decreased by 4% when wastewater was used to dilute the biomass. An increase in organic carbon and potassium in the reactor effluent was observed after gasification of the biomass with recycled process effluent. The addition of potassium hydroxide to the feed as a homogenous catalyst needs to be closely monitored and adjusted according to the potassium content of the reactor effluent. Insufficient salt separation proved to be an issue regarding formation of solid deposits in the reaction system.

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