Review

Reactor systems for syngas fermentation processes: a review

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Reactor systems for syngas fermentation processes: a review

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Highlights

- Operation principles of the main bioreactor configurations in syngas fermentation
- Operational parameters maximizing bioreactors' productivities
- Comparison of the mass transfer efficiency of different bioreactor setups
- Current status in commercialization of syngas fermentation

Abstract

Implementation of biofuels as an alternative to fossil fuels has been established as an answer to climate change by limiting GHG emissions. Syngas fermentation has emerged as a promising process for the conversion of waste biomasses to valuable products with bioethanol being on the main focus. However, the bottleneck of the mass transfer of syngas compounds H_2 and CO along with low production yields has set barriers to the development of an industrial scale plant. Recent research indicates that many different methodologies spring up in order to face this important challenge. The aim of this review is to assemble all these techniques applied in syngas fermentation, focusing on the different bioreactor configurations