Coupling Calculation of Micro-interface Mass Transfer in Anaerobic Fermentation Process

Yao Feng[1], Lin Zhang[2], Li Ren[3], Xiemin Liu[4], Ya Fan[2], Feng Zhang[5], and Zhibing Zhang[1]

[1]Nanjing University
[2]Dalian Research Institute of Petroleum and Petrochemicals, SINOPEC
[3]NYU
[4]Affiliation not available
[5]nanjing university

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Abstract

For the carbon dioxide desorption in anaerobic fermentation process, a mathematical model for the micro-interface mass transfer of a multi-component single bubble was established. Based on the theory of gas generation, the relationships between bubble shape, mass transfer and energy consumption required for bubble generation were discussed. Design indicator such as effective mass transfer height and effective stay time of the bubbles have been established to guide the optical selection of initial bubble size and liquid level height (reactor height). On this basis, calculation of multi-bubble system was further performed to evaluate the influence of bubble size on the gas holdup, and energy consumption. It was found that the performance evaluation based on gas flux was obtained, and the influence of bubble radius on gas mass transfer rate and gas holdup under a certain flux was investigated

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