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TRANSPORT PHENOMENA & FLUID MECHANICS

喷动床中气体停留时间分布的研究

孙淑兰，刘晓军，魏伟胜

TheKeyLaboratoryofCatalysis,ChinaNationalPetroleumCo.,ChinaUniversityofPetroleum,Beijing102249,China

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摘要 In a spouted bed of 80mm in ID and 1700mm in height, the gas residence time distributions at different radial positions in both spout and annular area were measured with five different kinds of particles as spouting material, air as spouting gas, and hydrogen as tracer. The effects of superficial gas velocity, operating pressure, particle size and its category on gas residence time distribution were discussed. It was found that the gas velocity profilein spout was more uniform than that in annulus. It could be concluded that the gas flow in the spout could be treated as a plug flow, while that in the annulus inhibited a strong non-ideal flow behavior. Increasing the superficial gas velocity and decreasing the operating pressure, the particle density and its size gave rise to spouting disturbance, thus the measured tracer concentrations vs. time curves fluctuated. The variances of residence time distribution curves could be taken as a measure of the gas fluctuation degree.

关键词 residence time distribution; spouted bed;

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Gas Residence Time Distribution in a Spouted Bed

SUN Shulan, HAN Xiaojun, WEI Weisheng

TheKeyLaboratoryofCatalysis,ChinaNationalPetroleumCo.,ChinaUniversityofPetroleum,Beijing102249,China

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Abstract In a spouted bed of 80mm in ID and 1700mm in height, the gas residence time distributions at different radial positions in both spout and annular area were measured with five different kinds of particles as spouting material, air as spouting gas, and hydrogen as tracer. The effects of superficial gas velocity, operating pressure, particle size and its category on gas residence time distribution were discussed. It was found that the gas velocity profilein spout was more uniform than that in annulus. It could be concluded that the gas flow in the spout could be treated as a plug-flow, while that in the annulus inhibited a strong non-ideal flow behavior. Increasing the superficial gas velocity and decreasing the operating pressure, the particle density and its size gave rise to spouting disturbance, thus the measured tracer concentrations vs. time curves fluctuated. The variances of residence time distribution curves could be taken as a measure of the gas fluctuation degree.

Key words residence time distribution; spouted bed;

通讯作者
孙淑兰 Email: hanxj@bjpeu.edu.cn
作者个人主页: 孙淑兰，韩晓军，魏伟胜

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