

RESEARCH NOTES

多管气升式环流反应器的液体循环

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摘要 A multi-tube air-lift loop reactor (MT-ALR) is presented in this paper. Based on the energy conservation, a mathematical model describing the liquid circulation flow rate was developed, which was determined by gas velocity, the cross areas of riser and downcomer, gas hold-up and the local frictional loss coefficient. The experimental data indicate that either increase of gas flow rate or reduction of the downcomer diameter contributes to higher liquid circulation rate. The correlation between total and the local frictional loss coefficients was also established. Effects of gas flowrate in two risers and diameter of downcomer on the liquid circulation rate were examined. The value of total frictional loss coefficient was measured as a function of the cross area of downcomer and independent of the gas flow rate. The calculated results of liquid circulation rates agreed well with the experimental data with an average relative error of 9.6%.

关键词 [reactor](#) [air-lift loop reactor](#) [multi-tube](#) [liquid circulation velocity](#) [frictional loss coefficient](#)

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Liquid Circulation in a Multi-tube Air-lift Loop Reactor

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Abstract A multi-tube air-lift loop reactor (MT-ALR) is presented in this paper. Based on the energy conservation, a mathematical model describing the liquid circulation flow rate was developed, which was determined by gas velocity, the cross areas of riser and downcomer, gas hold-up and the local frictional loss coefficient. The experimental data indicate that either increase of gas flow rate or reduction of the downcomer diameter contributes to higher liquid circulation rate. The correlation between total and the local frictional loss coefficients was also established. Effects of gas flowrate in two risers and diameter of downcomer on the liquid circulation rate were examined. The value of total frictional loss coefficient was measured as a function of the cross area of downcomer and independent of the gas flow rate. The calculated results of liquid circulation rates agreed well with the experimental data with an average relative error of 9.6%.

Key words [reactor](#); [air-lift loop reactor](#); [multi-tube](#); [liquid circulation velocity](#); [frictional loss coefficient](#)

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