多相流和计算流体力学

利用U形管测量低压环雾状流与液束环状流体积含气率

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摘要　　由能量方程出发，根据U形管垂直上升段与下降段的重位压降与摩阻压降的大小及方向之间的关系求得体积含气率测量模型，并通过实验研究了体积含气率测量误差的影响因素，利用体积含气率测量误差与流动密度测量值之间的线性关系对体积含气率进行了修正，使测量精度明显提高，并通过独立实验进行了验证。最后分析了U形管测量低压气液两相流体积含气率的适用范围。

关键词

U形管　气液两相流　体积含气率　流动密度

分类号

Gas volume fraction metering with U tube in low pressure annular-mist and wispy annular two-phase flow

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Abstract

A measurement model of gas volume fraction（GVF） was deduced based on the energy equation，and the relationship of friction pressure drop between two vertical sections of U tube was considered.The measurement errors were investigated through experiment under low pressure annular-mist and wispy annular two-phase flow.The effects of gas mass friction，gas volume friction and flux density on gas volume fraction were analyzed and gas volume fraction was corrected with flux density.This correction improved the accuracy of gas volume fraction，and the correction method was verified through another independent test.

Key words

U tube　gas-liquid two-phase flow　gas volume fraction　flux density

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