反应堆工程

窄矩形通道内两相流动压降特性研究

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摘要　以空气和水为工质，在$40\ \text{mm} \times 1.6\ \text{mm}$的窄矩形通道中对竖直向上气-液两相流动压降特性进行了实验研究。对比了现有的两相流动阻力计算关系式，结果表明，传统的计算关系式均不适用于窄矩形通道内两相流动阻力的计算；而以窄矩形通道为基础的Lee-Lee关系式误差相对较小，但预测值与实验值相比整体偏小。为此结合实验数据，以分液相-分气相雷诺数之比Re_l/Re_g为依据将流动分为两个区域，分别对Chisholm关系式进行修正，修正关系式与实验数据的误差较小，能够很好地预测本次实验结果。

关键词　窄矩形通道　摩擦阻力压降　洛克哈特-马蒂里参数

分类号

Investigation on Resistance Characteristics of Two-Phase Flow Through Narrow Rectangular Duct

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Abstract　Two-phase frictional pressure drop of air-water mixture was studied in a narrow rectangular duct with cross-section 40 mm by 1.6 mm. The experimental results show that the conventional correlations fail to predict the two-phase frictional pressure drop in narrow rectangular duct; Lee-Lee correlation which is based on the rectangular duct gives a relatively good agreement with our experiment, but has lower values than the experimental data. Different modified Chisholm correlations were proposed in two regions which were distinguished by the ratio of liquid Reyonlds number and gas Reyonlds number. The modified correlation has a good agreement with the experimental data.

Key words　narrow　rectangular　duct　frictional　pressure　drop　L-M　parameter

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通讯作者