

多相流

错流旋转填料床气相压降特性

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收稿日期 2006-4-3 修回日期 2006-6-7 网络版发布日期 2007-5-8 接受日期

摘要 旋转填料床的气相压降是旋转填料床应用和设计的一项重要指标。在气液两相错流流动条件下,利用空气-水系统对错流旋转填充床的气相压降进行分段模型化和实验研究。按照错流旋转填料床气体流动的路径将气相压降分为进口压降、填料层压降、集气段旋转动能转化压降和出气段压降。推导出压降与操作工况的关联式,其计算值与实测值吻合较好。实验表明错流旋转填料床的气相总压降与气体流量、旋转床转速、液体流量有关。在高转速和小气量的条件下,气相压降随气量增大先下降后上升;其他情况随气量增大而上升。错流旋转填料床气相压降随转速上升而下降,在小气量情况下转速对气相压降有明显影响。气相压降随进液量的增大而增大,当旋转填料床在低转速时进液量对气相压降有明显影响。

关键词 [旋转填料床](#); [错流](#); [压降](#)

分类号

Characteristics of gas pressure drop in cross-flow rotating-packed bed

Abstract

The gas phase pressure drop in the cross-flow rotating packed bed (RPB) is an important factor in its application and design. The gas phase pressure drop was investigated with air-water system. The total pressure drop was divided into four stages according to gas flow path—gas inlet pressure drop, rotating packed bed pressure drop, transformation of kinetic energy in gas collector and gas outlet pressure drop. The total pressure drop was measured and correlated with experimental values. The simulation result from the model coincide with experimental measurements. The experimental data showed that the total pressure drop of the cross-flow RPB was influenced by rotating speed, gas flow rate and liquid flow rate. The total pressure drop decreased first and then increased with increasing gas flow rate in the case of low gas flow rate and high rotating speed. In other cases the total pressure drop increased with increasing gas flow rate. The total pressure drop decreased with increasing rotating speed, and the change was obvious at a low gas flow rate. The total pressure drop increased with increasing liquid flow rate, and the change was obvious at a low rotating speed.

Key words [rotating packed bed \(RPB\)](#); [cross-flow](#); [pressure drop](#)

DOI:

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