

流体力学与传递现象

## 垂直风冷翅片管中氨水鼓泡吸收特性

罗玉林, 徐士鸣

大连理工大学能源与动力学院

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摘要

详细描述了垂直风冷翅片管吸收器中氨水鼓泡吸收的传热和传质过程。管外侧套用翅片,管内侧中氨水吸收溶液和氨气都从吸收器的底部流入、顶部流出。根据质量守恒方程和能量守恒方程建立了热质传递的微分数学模型。该模型分析了吸收器中两相流(即波动流、弹状流、泡状流)的变化,同时考虑了不同的两相流中气液相之间的热质传递以及两相流与管外空气之间的热量传递。通过解模型的微分方程,得到了一些重要参数(温度、摩尔分数)的局部值以及这些参数在吸收高度方向上的变化趋势。

关键词

[鼓泡吸收](#) [氨水](#) [热质传递](#) [空气冷却](#)

分类号

## Ammonia-water bubble absorption in air-cooled vertical finned tube

LUO Yulin, XU Shiming

### Abstract

A detailed description of the heat transfer and mass transfer during ammonia-water bubble absorption in air-cooled vertical finned tube is presented. The tube is externally finned. The ammonia-water absorbent and ammonia vapor enter the absorber at the bottom and leave at the top. A differential mathematical model for the heat and mass transfer is proposed based on mass and energy balances. The changes of the two-phase flow, such as churn flow, slug flow, and bubble flow, are analyzed. The heat and mass transfer between the vapor phase and the liquid phase in different two-phase flow, and the heat transfer from the two-phase flow to the air outside the tube are considered. Solving the differential equations, local values of some important parameters temperature, molar ratio and their variations along the absorber length are obtained.

### Key words

[bubble absorption](#) [ammonia-water](#) [heat and mass transfer](#) [air-cooled](#)

DOI:

通讯作者 罗玉林 [luoyulin2003@163.com](mailto:luoyulin2003@163.com)

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