

分离工程

磁场作用下垂直管外氨水降膜吸收的模型研究

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摘要 在氨气吸收过程中增加了宏观磁场力, 考虑了吸收过程中降膜溶液膜厚的变化、膜厚方向的对流以及氨水溶液物性的变化, 建立了磁场条件下垂直管外氨水降膜吸收数学模型。在磁感应强度0—3T范围内, 对数学模型进行数值求解, 得到温度、浓度、速度分布等参数。结果显示磁场对于氨水降膜吸收过程有一定的增强作用。

关键词 [降膜吸收](#) [模型](#) [氨水](#) [磁场](#)

分类号

Numerical Modeling of Falling Film Absorption outside Vertical Tubes with Ammonia-Water in the presenting of Magnetic Field

Abstract

Magnetic field was employed in the absorption course of ammonia-water absorption refrigeration. The numerical model of falling film absorption outside vertical tube with ammonia-water in the presenting of magnetic field was set up. The macroscopic magnetic force was added in the equation of momentum. In the process of modeling, the variation of falling film thickness, the variation of physical characteristics of ammonia-water and the convection in the direction of the film thickness were considered. The distribution of temperature and concentration and temperature of falling film were obtained within 0-3T of magnetic induction intensity by numerical solving. The results show that the absorption heat, the absorption mass, the mass transfer coefficient increased with the increase of magnetic induction intensity. The falling film absorption with ammonia-water could be strengthened to some degree by external magnetic field.

Key words [falling film absorption](#) [numerical model](#) [ammonia-water](#) [magnetic field](#)

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