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論文名稱: 水平圓管滴淋蒸發之熱傳分析與兩相流場模擬

英文論文名稱: Analysis of Falling Film Evaporation on Horizontal Tubes and Numerical Simulation

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學位類別: 碩士

校院名稱: 國立臺北科技大學

系所名稱: 冷凍空調工程系所

學號: 92458031

學年度: 93

語文別: 中文

論文頁數: 183

關鍵詞: 滴淋式蒸發器；冷媒分配器；兩相流；薄膜蒸發；計算流體力學；氣液界面；連續表面

英文關鍵詞: Falling Film Evaporator ; Refrigerant Distributor ; Two Phase Flow ; Computational Fluid Dynamics ; Continuum Surface Force

被引用次數: 0

[摘要]

本研究水平圓管滴淋薄膜蒸發，利用實驗與數值模擬之兩種方法探討滴淋式蒸發器之熱傳性能。實驗方面以三根水蒸發模式與模擬流場做印證，實驗結果與文獻中之經驗公式吻合。在數值模擬方面，將幾何模型分爲冷媒分配器之部份。

模擬冷媒分配器以穩態重整化群紊流(RNG k-ε)模式計算，在1.6g/s—6.4g/s的三種冷媒入口流量下，改變分配器內場分佈作爲設計分配器之參考。冷媒分配器模擬結果發現，改變供給系統流量，分配器內管之孔間距與孔徑比例應壓力流場分佈，因此縫隙寬度設計必須依據內管滴淋圓孔尺寸做適當調整。在模擬測試室滴淋蒸發兩相氣液流場分以UDF方式引入蒸發模型；氣液界面以三維尤拉格點不相溶流體之體積分率，並搭配連續線性界面重建與連續表面淋蒸發模擬結果發現，蒸發器負載應隨供給流率做適當調整，以避免管集表面過熱發生；提高供給蒸發器流量可減呈乾枯現象，此與實驗結果有所差異，也因此模擬之蒸發熱傳係數遠低於實驗值。

[英文摘要]

Numerical simulations and experiments of spray type (falling film) evaporators were conducted in the present stu performed on an apparatus having three smooth horizontal tubes using R-134a. Flow visualization was also cond experiment. The test results reasonably agree with predictions of two empirical correlations in the literature. The simulation of liquid distributor, and two phase flow simulation on evaporating tubes.

The liquid distributor consists of two tubes. The inner tube has a series of pores and the outer tube has a slit on t compared with various geometric parameters including pore size, pitch and gap. The simulation reveals that the important factors for 1.6 g/s—6.4 g/s flow rates. For the two phase flow simulation in the evaporator, a simplified and linked to the commercial computational fluid dynamic simulation code, FLUNET. The Continuum Surface Fo simulation, and the VOF model was selected as the two phase model assuming liquid and vapor as two separate problem can be relieved by increasing the inlet flow rate or decreasing heat input. However, the two-phase flow s regions as compared with experimental observations. As a result, the evaporation heat transfer coefficient is und

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