

A Study on the Heat Transfer Characteristics of Semi- Flooded Type Evaporator Fin Tube for Adsorption Chiller

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Extended Abstract

The purpose of this study is to compare the heat transfer performance of an adsorption chiller's evaporator with and without a hydrophilic coating applied to a fin-tube heat exchanger. The evaporator used in this study is a semi-flooded type, which utilizes the capillary phenomenon to induce efficient refrigerant evaporation without requiring a refrigerant circulation pump. The hydrophilic coating is prepared by using a coating solution of aluminum oxide and a water-soluble hardening agent, which is then applied using the dip-coating method. The researchers investigated the effect of the weight ratio of aluminum oxide powder as a coating variable and found that a coating solution with a weight ratio of 31 wt% resulted in excellent coating surfaces in almost all ranges. The study revealed that the heat transfer rate and overall heat transfer coefficient of the fin-tube coated with this coating method increased by up to 1.6 times compared to the uncoated case under the operating conditions of the adsorption-type evaporator.

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