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Study on heat transfer of falling film evaporation characteristics on heat pipes in negative pressure

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ABSTRACT

As a high performance heat transfer method, heat pipes are being widely used in different fields of industry. Based on the boundary layer theory in the article, the rules of the velocity and the thermal boundary layers outside the heat pipe falling film evaporation in the negative pressure are discussed, and the formulas of thickness of both velocity and thermal boundary layers are given. Then based on these formulas, the calculation method of the falling film evaporation heat transfer coefficient outside the heat pipe is discussed. The effects of vacuum, falling liquid load, temperature gradation and etc. on the evaporation performance of heat transfer are analyzed. It provides the guidance in desalination application of the evaporation outside the heat pipe in negative pressure.

Keywords: Heat pipe; Falling film evaporation; Negative pressure

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