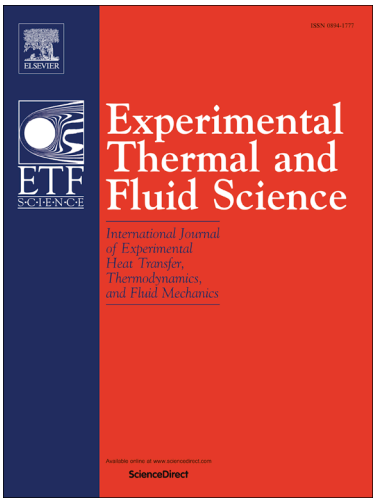

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PII: S0894-1777(17)30326-6
DOI: https://doi.org/10.1016/j.expthermflusci.2017.10.019
Reference: ETF 9243

To appear in: *Experimental Thermal and Fluid Science*

Received Date: 12 April 2017
Revised Date: 29 September 2017
Accepted Date: 19 October 2017

Please cite this article as: T. Ding, H. wen Cao, Z. guang He, Z. Li, Visualization experiment on boiling heat transfer and flow characteristics in separated heat pipe system, *Experimental Thermal and Fluid Science* (2017), doi: https://doi.org/10.1016/j.expthermflusci.2017.10.019

Visualization experiment on boiling heat transfer and flow characteristics in separated heat pipe system

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Abstract: This paper presents an experimental study on boiling heat transfer and flow characteristics in a separated heat pipe system. The flow patterns in liquid and vapor pipes are clearly observed, and the boiling heat transfer coefficient is measured. The main aim of this study is to examine the heat transfer characteristics at different filling ratios using a combination of visualization and measurement methods. First, the relationship between the boiling heat transfer coefficient and the heating capacity is analyzed at different filling ratios when the heat pipe system operates normally. Second, the conditions for reaching the heat transfer limits and the phenomena occurring at these limits are analyzed. The analysis of the heat transfer characteristics shows that for a given heating capacity, the boiling heat transfer coefficient in the evaporator remains nearly constant over a wide range of filling ratios. At a given filling ratio, the heat transfer coefficient increases with an increase in the heating capacity. Moreover, the flow pattern at the evaporator exit changes from slug flow to