

传递现象

竖直毛细微槽群热沉中蒸发液体的干涸特性

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摘要 利用宽视场体视显微镜和CCD摄像系统对纯蒸发换热情形下竖直放置的矩形毛细微槽群热沉中的液体沿微槽槽道方向的流动情况和干涸点高度(润湿高度)进行了观察测量,并对微槽几何尺寸、工质等因素对润湿高度的影响进行了实验研究。实验结果表明:纯蒸发情形下的液体润湿高度随着输入加热功率的增加而陡降;一定热负荷下,微槽较深、较窄以及微槽群密度较大时液体的润湿高度较高;甲醇和乙醇在较低输入加热功率条件下的润湿能力要强于蒸馏水;竖直毛细微槽中液体的润湿特性受重力的影响严重。

关键词 [体视显微镜](#); [蒸发换热](#); [毛细微槽群](#); [润湿高度](#)

分类号

Dryout characteristics of evaporating liquid in vertical capillary microgrooves heat sink

Abstract

By using a wide field stereo-microscope and a CCD video camera system, the axial liquid flow and dryout point (wetting height) in vertical rectangular capillary microgrooves heat sink were observed and measured under pure evaporation heat transfer conditions. An experimental study of the influences of microgroove geometric parameters and working liquids on wetting height was conducted. The results showed that the wetting height decreased sharply as heat input increased under pure evaporation heat transfer conditions. The microgrooves with a deeper depth, a narrower width or a higher microgroove density had higher wetting capacity. Methanol and ethanol had higher wetting capacity than distilled water in the low heat input cases. A serious negative effect of gravity on liquid wetting characteristics in vertical microgrooves was observed.

Key words [stereo-microscope](#); [evaporation heat transfer](#); [capillary microgrooves](#); [wetting height](#)

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