

摘要

我們利用了紙纖維材質作為主要的毛細結構，設計了一個可成功運作的平板式迴路熱管。它的蒸發器材質為銅，而補償室壁面和傳輸管部份則為玻璃材質。因此，當平板式迴路熱管正確運作時，我們可以觀察到工作流體在補償室及傳輸管內的流動情況。我們使用了三種不同的傳輸管，其中之一為平滑的玻璃管，其餘兩種為內壁鋪上銅網的毛細玻璃管。文內比較了不同的傳輸管對工作流體流動情況的影響，毛細玻璃管有較平穩的流況，而平滑玻璃管的流況則較為劇烈。我們亦設計了另一種結構的蒸發器，液態工作流體和蒸發器內生成的蒸汽位於毛細結構的同一邊，然而此種設計的迴路熱管無法正常啟動，文中亦討論了此種結構失敗的原因。



Abstract

We used paper fiber as wick structure and designed a flat loop heat pipe which could operate successfully. The evaporator was made of cooper while the wall of the compensation chamber and the transport line were both made of glass. While it operated correctly, we could observe the condition of the working fluid in the compensation chamber and the transport line. We have three kinds of transport lines. One was a smooth glass tube; the others were wick glass tubes with cooper meshes inside the tube. The comparison between the different transport lines was obtained. The working fluid flowed steadier in the wick glass tube than the smooth glass tube. We also designed a different evaporator structure, but this one couldn't operate successfully. The reason of this failure was also discussed.