

INVESTIGATION OF HEAT TRANSFER IN A HEAT PIPE WITH NANOPARTICLES COATING

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Abstract

The present paper contains data on the effect of the hydrophilic nanoparticles coating on a heat pipe surface. Alumina nanoparticles are deposited from the nanoliquid (colloidal solution) on the wall. This type of coating was selected after the investigation of pool and flow boiling on surfaces with alumina nanoparticles relief, where the significant increase of critical heat flux (CHF) was observed. The mechanism of CHF increase and enhancement of the transition boiling heat transfer can be explained by the wettability increase. The contact angle increase is also very desirable in horizontal heat pipes because it allows to obtain a uniform distribution of a liquid film along the perimeter of the heat pipe and a uniform temperature distribution as a result. Obtained results can be used in constructing of a thermal stabilizer and other thermal devices with enhanced heat transfer.