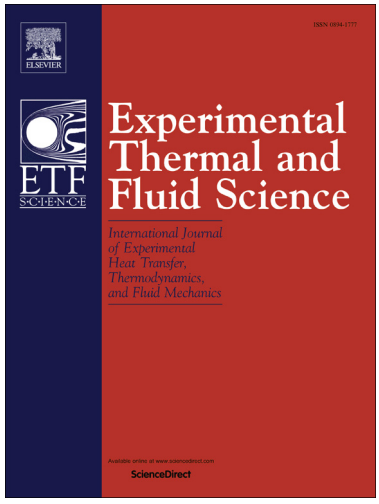

An experimental study on flow boiling pressure drop in multi-microchannel evaporators with different refrigerants

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An experimental study on flow boiling pressure drop in multi-microchannel evaporators with different refrigerants

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Abstract

A key parameter in designing two-phase flow systems for the cooling of high heat flux electronics is the pressure drop in microchannel evaporators. As a result, an experimental study was performed to investigate the flow boiling pressure drop of refrigerants in two silicon multi-microchannel evaporators. Three types of refrigerants (R1233zd(E), R245fa and R236fa) were tested under three inlet subcoolings and three nominal outlet saturation temperatures. The test section's backside base temperatures were measured by an infrared (IR) camera. A single-phase flow validation in terms of the inlet and outlet restriction pressure drops and the channel flow friction factor was carefully done before the boiling tests. The operating conditions for stable flow boiling tests were: mass fluxes from 1250 to 2750 kg $m^{-2}s^{-1}$, heat fluxes from 20 to 64 W cm^{-2}. The resulted maximum vapor quality at the outlet manifold was 0.51. It is found that within the present test conditions

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