

Abstract Submitted
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Pool Boiling of Ethanol-Water mixture on Nano-Textured Surfaces¹ ALEXANDER YARIN, RAKESH SAHU, SUMIT SINHA-RAY, SUMAN SINHA-RAY, University of Illinois at Chicago — An experimental and theoretical study of pool boiling of ethanol-water mixtures on nano-textured surfaces was studied. A comparison of pool boiling on bare copper surface with pool boiling on surfaces covered by copper-plated supersonically-blown nanofibers revealed a significant increase in the heat flux in the latter case. Namely, the heat flux on the nano-textured surfaces was about 3-8 times higher than that on the bare copper surfaces, while the surface temperature due to the nano-texture would be lower by about 10 °C at the same heat flux. The significant positive effect of the nano-texture is due to the fact that it facilitates bubble nucleation. Some preliminary results of numerical modeling of boiling process in the framework of the Cahn-Hilliard approach are discussed and several examples of the predictions are given.

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