INVESTIGATION OF A HEAT TRANSFER MECHANISM AND HEAT EXCHANGE INTENSITY AT SOME NANOFLUIDS BOILING

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Intensification of heat transfer is one of many urgent problems of modern science, technology and industry (nuclear power, rocketry, chemical and food) . All above listed machinery, equipment and technologies can not operate without intensive heat output. The solution is realized through the growth of the specific heat fluxes(SHF). Significant success has been achieved over the last decade in this field due to researches, developments and implementations of new processes, devices and technologies (heat pipe, heat transfer in porous structures, nanofluids at boiling regimes). Significant success has been achieved over the last decade in this field due to researches, developments and implementations of new processes, devices and technologies (heat pipe, heat transfer in porous structures, nanofluids at boiling regimes).

The presented study is dedicated to the last scientific direction. For this purpose there were constructed tests units, where pool boiling of nanofluids was conducted. As a heater it was used nichrome wire . Nichrome resistivity is depended on a temperature. This fact was taken as a basis of determining of the heater's temperature. All measurements and calculations of the parameters (current, voltage, SHF, heat transfer coefficient, etc.) were performed by a computer and developed software in real time.

Obtained results have allowed to make conclusions about an essential increase of specific heat flux when the heater continued to function (without burnout) for a number of nanofluids; an influence of initial concentrations of nanoparticles in liquids; a presence of dispersants; a nature of nanoparticles on SHF and heat transfer coefficients .

Present research allows to assume, that usage of nanofluids as heat mediums is able to intensify heat exchange in boiling modes with SHF under critical value. Such heat fluxes are applied in steam generators, sugar producing equipment etc.

KEY WORDS: Heat pipes, specific heat flow, dispersing, heat transfer coefficients.