

0. Intensification of heat exchange during chladones condensation and their composites inwardly pipes and channels including mini- and microchannels

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3. Results.

Experimental research of heat exchange is conducted during condensation of water, chladone of R-141b and mixtures of chladones of R-22 and R-407C in a horizontal pipe with the passive intensifiers of heat exchange – wire rings and wire longitudinal scope at the circular, *расслоенном* and asymmetric flow of phases. The field of temperatures is measured in the vertical section of the thick-walled test area, passing through circular intensifiers.

On the basis of measuring of local (on the perimeter of pipe) coefficients of heat emission into a smooth pipe and pipe with the intensified surface more clear and exact picture is got of character of hydrodynamics and heat exchange at the different modes (ring, stratified, wave) of flow of phases. The areas of regime parameters are exposed is steam-content, mass speed, closeness of thermal stream – in which substantial influence on the flow of tape of runback and heat exchange has a transversal stream of mass and took away liquids with steam. The analysis of scientific publications for the last ten years rotined considerable divergences in conclusions on theoretical and experimental researches. As a result of the conducted work more exact correlation is offered for the calculation of coefficients of heat emission during condensation in a smooth horizontal pipe.

The new original construction of the working thick-walled area is developed from high-heat-conducting material which provided the increase of exactness of book-mark of thermo-electric sensors of temperature in beforehand certain points in the volume of the thick-walled area, that allowed to promote exactness of measuring of the field of temperatures and thermal descriptions of process of condensation and, as a result, more correctly to determine the local coefficients of heat emission.

On the base of the measured field of temperatures and expected local coefficients of heat emission during condensation of chladone influence of step of location of wire coils is certain on intensity of process of heat emission. Experimental research of local heat exchange is conducted during condensation of water in a horizontal pipe with devices for the rollup of vapour-liquid stream as screw chladones with the corner of rollup of 45° at the different modes of flow of phases. Influence of rollup of stream is set on the local and middle coefficients of heat emission and on hydraulic resistance. It is set, in particular, that the mechanism of influence of rollup of stream on intensity of heat exchange during pellicle condensation consists in the increase of friction on the border of section of phases and hereupon in diminishing of thickness of tape of runback.

Calculation dependences are developed for local and middle heat emission during condensation of chladones in a horizontal pipe with active intensifiers taking into account character of the modes of flow of phases. Calculations rotined that setting of local swirlers can heave up the mid-coefficient of heat emission on 50-80% as compared to an uninvolute stream.

On the basis of measuring of the field of temperatures in the thick-walled experimental area authentication of the modes of flow of diphasic stream is conducted during condensation of chladone in a horizontal pipe with the active intensifiers of process of heat exchange. Criteria which allow on the regime parameters of process to forecast the mode of flow of diphasic stream during condensation of chladones in horizontal pipes and on this base grounded to choose the methods of calculation of heat transfer during condensation of chladones in horizontal pipes with active intensifiers are certain.

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