Heat pipes with nanocomposites analysis and application

Solar energy is one of the most interesting solutions among renewable energy resources as it can be converted easily whether into heat, cold, or into electricity. The main problem when using such an energy source is its unfair time distribution which may cause mismatch between needs and availability. Heat pipes, long thermosyphons (vapor dynamic thermosyphons, and flat polymeric loop thermosyphons) are of great interest as components of heat exchangers for recuperation of energy of renewable sources (solar, ground) and upgrading their potential with the help of heat pumps. Transparent heat pipes and thermosyphons with nanofluids and nano-coated surface inside considered in this research program are a good tool to absorb solar radiation in the volume of the fluid flow. Vapor dynamic thermosyphons cooling system is good solution for building-integrated photovoltaic technology. Development of the new environmentally – friendly and energy – efficient technologies will be vital to achieving investigation of a hybrid photovoltaics/thermo-collector (PV/T) systems, providing electricity and heat/cold simultaneously, represent an important step toward reducing dependency on fossil fuels.

Biography

Leonard L Vasiliev is the President of the NIS Association “Heat Pipes”, Chief Researcher of the Luikov Heat and Mass Transfer Institute, National Academy of Sciences, Belarus. He started his scientific career with studies of thermal properties (thermal conductivity, heat capacity, thermal diffusivity) of solid materials at cryogenic temperatures and developed a new non-stationary method of its measurements (1960-1964) in the Luikov Heat and Mass Transfer Institute under the guidance of Professor Alexis Luikov as his Supervisor. He obtained the first Doctor’s degree (Candidate of science) in 1964 in Minsk with the thesis “Thermal properties of solid materials at cryogenic temperatures”.

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