



METHOD OF ENERGY EFFICIENCY ENHANCEMENT OF COMPRESSOR REFRIGERATION SYSTEMS BY MEANS OF THE IMPLEMENTATION OF NANOTECHNOLOGY

The purpose and scope of application

The technology of the production of nano-oils, nano-coolants and nano-refrigerants with regulation of their thermophysical properties and heat transfer characteristics are proposed to enhance the energy efficiency of refrigerating industry. The fundamental difference of the proposed technology from the prototype is the consideration the change in nanofluids properties and heat transfer characteristics of processes with nanofluids. The implementation of the proposed technology will lead to reduce the energy consumption of the operating refrigeration systems and reduce the material consumption of heat exchangers in new refrigeration systems.

Important parameters that characterize the level of scientific results

The reducing in energy consumption of refrigeration compressor systems within 5-10% can be obtained.

The intensification in heat transfer processes, consequently reducing the cost of heat exchangers (evaporators and secondary heat exchangers) within 5-10% can be obtained.

The refrigerants, compressor oils and coolants are proposed to use as basic fluids for nanofluids preparation. The metals, metal oxides nanoparticles and fullerenes additives to base fluids.

Intellectual Property Protection Status

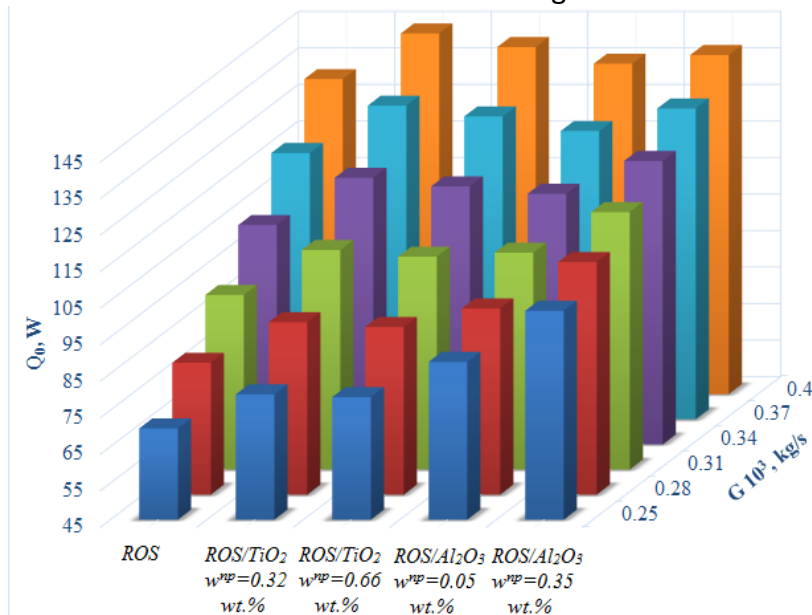
Two patents were obtained.

Market demand

The proposed nanofluids will demanded by producers of coolants and refrigerants and by producers of equipments in which used this fluids. The main purpose of implementation of these fluids is enhance the competitiveness of products (refrigeration equipment, cooling systems for transformers, combustion engines, radio-electronics devices, including dual-purpose applications).

Status of development

The technology of the production of nano-oils, nano-coolants and nano-refrigerants has been developed. The effect of nanoparticles on thermophysical properties, energy efficiency of compressor refrigeration system and on heat transfer coefficients at boiling and forced flow has been investigated.



Cooling capacity of working fluids (refrigerant/oil solution ROS) at different operating parameters