ABSTRACT

Combined protection against corrosion and scale generation of heating systems using ultrasound and anti-scales

Yatsishina N.Y. - Kyiv, NTUU “Igor Sikorsky Kiev Polytechnic Institute "ChTF, CE-51M.

Master's thesis. Number of pages – 89, tables – 23, figures – 24, sources - 52, 2017.

The processes of scale formation and corrosion on the surface of heat exchange using ultrasound with a frequency of 28 kHz of low power in the pre-cavitation and transitional modes and without it are investigated. Functional dependences of increasing the specific mass of scale and the steel corrosion rate were determined depending on the modes of ultrasound irradiation. The effect of the joint action of anti-calcane OEDF and ultrasound on the processes of Scum formation and corrosion was investigated. The antinuclear properties of rapeseed meal extract were first studied. The structure of the scattered layers formed by raster electron microscopy has been estimated. It was established that co-treatment with ultrasound and reagent facilitates the formation and maintenance of a phase microscope with protective properties, practically not reducing the heat exchange between the metal surface and the heat carrier.

The purpose of the work is to inhibit scale formation and corrosion processes by a combined physic-chemical method to increase the efficiency of the operation of heat-exchange equipment. Object of research - corrosion processes and scale formation on the surface of metals at elevated temperatures in water under ultrasonic and reagent treatment. The subject of research is the influence of the combined physic-chemical method on scale formation and corrosion when modeling the operation of a water boiler.

Key words: ultrasound, scale formation, corrosion rate, inhibitor.