SYSTEM OF AUXILIARY COMBINED ELECTRODE IN INSTALLATION FOR ELECTRICAL TREATMENT OF LIQUIDS

D. Iliukhin, postgraduate

S. Usenko, candidate of engineering science

Modern development of agricultural production requires the use of advanced technologies that can provide maximum efficiency, process automation, high production standards and environmental cleanliness.

One of the promising directions of cooperation electrotechnologies is using strong electric fields with dysperhirovanymy materials that carry electrical charge.

To disinfect water main factor is ozone, which is under the influence of a strong electric field generated in the air gap between the electrode and the water surface. To increase the concentration of ozone should increase the frequency of discharges in the air gap. So was proposed plant for processing liquid and liquid products in which a design included additional electrode dielectric system electrodes which are centers have additional digits.

Auxiliary electrode system consists of composite electrodes is a hollow cylindrical tube made of dielectric material and sealed on both sides to prevent the ingress of liquid inside. Inside dielectric cylindrical metal tubes introduced initiators digits. Auxiliary electrodes combined installed through the holes in the upper flat electrode.

Metal bits initiators can increase the frequency of discharges and consequently ozone, efficiency and processing performance. Pulse frequency adjustable elevated voltage between the electrodes, the thickness of the layer of liquid and the air gap between the liquid and the upper electrode, and the combined number of auxiliary electrodes. The intensity of the ionization process is controlled by the inductive sensor millivoltmeters.

In conducting research using Kilovoltmeters S96, to analyze bit processes occurring in the cell processing - electronic Oscilloscope RIGOL DS1102E bandwidth range of 100 MHz.

Analysis of oscillograms bit processes during processing fluid revealed that the presence of the camera combined processing auxiliary electrode greatly increased frequency surface discharge that increases the concentration of ozone in the treatment chamber, and hence to improve the quality of treatment fluid.

Also, studies to establish the initiators of the metal diameters depending on the frequency of discharges. Increasing the diameter of the metal initiator bits within the combined additional electrodes increases the frequency of discharge processes.

To reduce material consumption and manufacturing cost of the installation was conducted additional research on the frequency dependence of surface discharges of structural parameters of metal initiators digits.

Analyzing studies found that combined two additional electrodes Nearby increase the frequency of surface discharges compared to one electrode larger section. Two electrodes with section 2.5 mm2 give greater frequency than two electrodes cross section of 1.5 mm2. So is better to use two additional electrodes combined section 2.5 mm2 located near to each other than the one electrode of larger area (10 mm2). This will reduce the consumption of materials and manufacturing setup costs and increase the efficiency of processing fluids and of the installation as a whole.

As a result of studies found that the presence of the camera combined processing auxiliary electrode greatly increased incidence bit processes. This leads to an increase in the concentration of ozone in the treatment chamber, and hence to improve the quality of treatment fluid. Also the design of more effective combination electrode system which involves the use of two additional electrodes cross section 2.5 mm2 next to each other.