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RATIONALE FOR ENERGY EFFICIENT WAY POWER SYSTEMS ELECTROTECHNOLOGY CLEAN WATER SOLUTIONS

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Use of power sources electrolyzers capable of applying in the prescribed forms or different pulse current load in purification systems water solutions will qualitatively change the system performance and provide high energy efficiency.

Providing Power Supplies possibility to automatically select and implement the most effective form of pulsed current depending on the process of technological change and possible contaminants prydast adaptive system properties that will in some cases reach nearly 50% reduction in total power consumption compared to stationary electrolysis.

But at present time there developed the principle and method of control power supply systems purification electrolysis of aqueous solutions using adaptive selection of the most effective forms of pulsed current load, depending on the concentrations of various substances in aqueous solution, expressed in general terms, through the initial pH of the solution.

The purpose of research – justification for energy-efficient power supply control method of purification electrolysis of aqueous solutions using adaptive selection of energy efficient forms of pulsed current load, depending on the initial pH of the aqueous solution.

Materials and methods research. The basic object of study – process cost electricity power supply electrolysis purification of aqueous solutions with different pH.

Purpose of the study - the control system power supply, issuing the appropriate form of impulse load current electrolyzer.

For this purpose use electrolyzer power supply with the ability to publish to output terminals specified shape pulse current load current form generator with automatic switch-contact forms between current and pH-meter (potentiometer).

The goal decided improvement method of controlling power source management system by providing adaptive properties in choosing the best form of pulsed current load by introducing a system of control unit automatically select the optimal, energy efficient, form a given method for appropriate technological mode, tasks and pH of the working solution.

Results. The diagram of improving management control system power supply for electrolysis of water purification solutions, shown in Fig. 1.

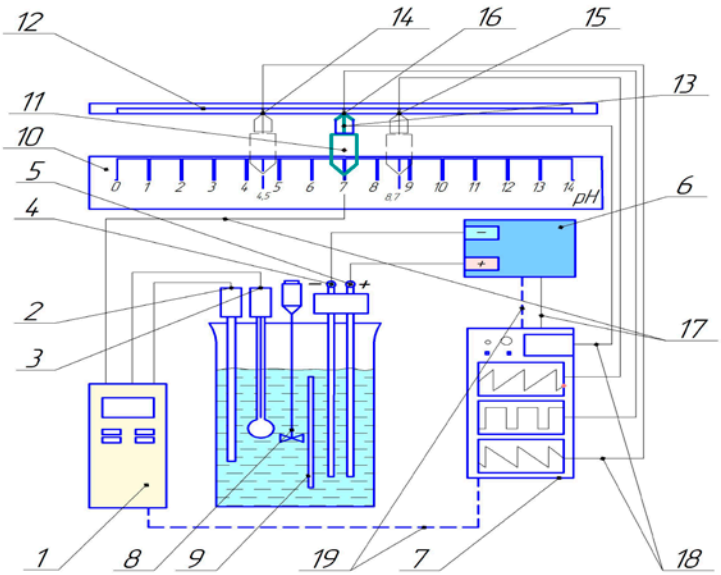

Fig.1. Control circuit power supply control system for electrolysis of water purification solutions:

1 - pH meter; 2 - sensor pH meter; 3 - combined glass electrode pH meter; 4 - cathode; 5 - anode; 6 - power supply electrolyzer; 7 - s form generator pulse load current (possibly with intelligent block selection); 8 - device for mixing; 9 - dielectric wall; 10 - measuring scale potentiometer; 11 - mobile signal adapter potentiometer; 12 - plate current form control; 13 - rolling pin adapter switching multi-configuration; 14-16 - point configuration switching current form; 17-18 - lines positional control; 19 - lines predictive control (for systems with intelligent block selection).

Points switching current forms are adjusted in accordance with the laws regulating functions that are aperiodychnosti depending on the characteristics and properties of technological requirements relevant changes in pH of the solution or process.

The control system according to the technological goal can use one switch point, two, or a few more.

Conclusions

1. The use of the proposed method for managing energy-efficient power supplies of clean water electrolysis solutions through adaptive selection of the least costly form of electrical pulse current load will ensure energy-efficient operation of the system.

2. Method of selection of energy-efficient forms of pulsed current load prydast system adaptive and preventive properties in situations related to penetration in uncontrolled disturbances pollutants of anthropogenic, natural or even controlled biologically dangerous nature.

3. The architecture of the control system must be performed in one unit that includes a power supply, generator current form, the control parameters (pH, current, voltage, current form biologically hazardous substances, etc.) and intellectual power.

4. . Taking into account that the energy-efficient electrolysis process purification of aqueous solutions is multifactorial and nonlinear problems, to solve the goal should be used mathematical apparatus of fuzzy neural networks are working effectively and solves the problem for such difficult conditions.

Power supply, energy efficiency, water treatment, pH, electrolysis, surge current, pulse shape, efficiency pulsed mode, current selection form.