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## **EXPLORATION OF THE HIGH SPEED PROCESSES IN DESIGNING OF PULSED ELECTROTECHNOLOGIES**

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This article is dedicated to the 100th anniversary of operation of the first main water pipeline in Azerbaijan, named “Schollar-Baku”, designed in 1917 by English engineer William Lindley, provided to this day Baku by clean drinking water. In recent years, due to the depletion of resources, violation of ecological balance on the planet, climate change, etc., pays great attention to development of energy-efficient, energy-saving devices and environmentally clear technologies. For solution of the energy efficiency of such electric technologies is required the gradual transition from the low-frequency exposure methods to short duration (micro and nanosecond) high-frequency pulsed ones. This provides a powerful and useful liberation of the huge energy of pulsed source on explored object for shortest time and realization of high-speed processes, beneficial effected on treated mediums. This article to development of high-frequency electric technologies (micro and nanosecond) for cleaning and disinfection of drinking and waste water from dispersible and bacteriological pollutants is devoted. Complex explorations of high-speed processes in the water medium, the optimal electrical parameters of the energy source and impact modes (crown and spark discharges) on investigated objects are considered. Empirical formulas for determination of the main discharge characteristics (delay time, breakdown time, emitted energy) and parameters of water gap (inter-electrode distance), at which an effective work regime of high voltage equipment is reached, are given. The possible mechanisms of water breakdown and high speed processes, volt-second diagrams are presented. It is shown, that on spark regime in water medium and positive polarity of potential electrode is achieving the maximum inactivation level of bacteriological cells (1010). It was found, that combination of micro and nanosecond effects on water medium may lead to formation of high-energy run away electrons, generating shortwave radiation and promoting penetration of nanosecond electric fields into nucleus, suspending the further reproduction of cells.

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