

OZONIZER WITH SUPERIMPOSED DISCHARGE FOR INACTIVATION OF MICROORGANISMS

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The ozonizer, where the double barrier discharge in combination with the surface discharge is used for ozone generation, is proposed for inactivation of microorganisms. Two high-voltage pulsed 10W and 20W power supplies have been used for the discharge ignition in ozone generator that has three parallel electrodes (central, surface, and outer one). The phase between applied voltages may be varied from 0° to 180°, the breakdown voltage for the discharge gap of 2.5 mm is smaller than in DBD (6 and 8 kV, respectively), and output ozone concentration is higher and reaches up to 30 mg/l at the output of ozone generator. The ozone-air mix runs to the sterilization camera filled with water, where the ultrasonic cavitation is generated by the ultrasonic 50W source. The water temperature is maintained at 15°C by the Peltier cooler. Under this condition, the ozone concentration in water medium is 10 mg/l. The following test results show the effectiveness of the sterilizer. Time intervals required for inactivation of typical bacteria groups in the sterilizer are as follows: *E. coli* 055 K 59 № 3912/41 – 2 minutes, *Staphylococcus aureus* ATCC № 25923 – 2 minutes, *Pseudomonas Aeruginosa* 27/99 – 2 minutes, *Cl. oedematiens* 198 – 5 minutes, *B. cereus* № 8035 – 10 minutes. Selection of the water temperature, the ozone concentrations and ultrasonic power allowed to determine the time necessary for destroying the row of micro organisms.