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# **ОСВІТА, НАУКА ТА ВИРОБНИЦТВО: РОЗВИТОК І ПЕРСПЕКТИВИ**

## **МАТЕРІАЛИ**

### **І Всеукраїнської науково-методичної конференції,**

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**SUPPLEMENTED SERIES WITH SIMULTANEOUS ACTION OF GASES  
AND CAVITATION ON THE *DIPLOCOCCUS* DESTRUCTION**

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Saturation of the treated aqueous medium by gases during cavitation water disinfection is very important regardless of the method of cavitation perturbation. But process effectiveness depends on the nature of gas bubbling into reaction zone. In [1,2] were shown water disinfection from diplococci bacteria under simultaneous action of cavitation and such gases as argon, oxygen and carbon dioxide. Cultural features of investigated microorganisms are presented in [3]. In previous studies we have found the highest decontamination degree under the action of Ar and cavitation. So, the aim of further research was to study the action of nitrogen and air on the destruction process from the same bacteria types. The experimental conditions: ultrasonic generator of 22 kHz and intensity of  $1.65 \text{ W/cm}^3$ ,  $T=298\pm 1\text{K}$ ,  $P=1\cdot 10^5 \text{ Pa}$ , process duration was 2 hours.

An ultrasound action on the water disinfection from *Diplococcus* bacteria types in the presence of additional gases (nitrogen, helium, air) to continue the relative series of effective microorganism's destruction under cavitation conditions. The effective rate constants of cell inactivation and destruction degrees were calculated.

The general and combined relative series of *Diplococcus* effective destruction in water medium under cavitation conditions in the gas atmosphere is below:

**$\text{N}_2 > \text{Ar} > \text{He} > \text{O}_2 > \text{air}$**

Hence, the highest effect of nitrogen was found, but the lowest efficiency of oxygen and air has been established under cavitation treatment. It was confirmed that cavitation process of water disinfection regardless of the gas bubbling nature can be described by kinetic equations of the first order.

References

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