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ABSTRACTS

Taras Shevchenko National University Of Kyiv

Bogolyubov Institute for Theoretical Physics of the National Academy of Sciences of Ukraine

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Bogolyubov Institute for Theoretical Physics
of the National Academy of Sciences of Ukraine

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DEVICE FOR DISINFECTION OF WATER BY USING ULTRAVIOLET RADIATION

Anatoly A. Semenov
Poltava University Economy and Trade, Poltava 36014, Ukraine
Corresponding author e-mail: asemen2015@gmail.com

The method of ultraviolet disinfection of water is one of the physical, reagentless methods. The most effective impact energy of UV radiation from germicidal perspective occurs at a wavelength of 253.7 nm [1].
The purpose of the proposed technical solution is to simplify the design and reduce maintenance costs while maintaining the efficiency of disinfection of water.
In the known structures devices of productivity and the size of the Rays camera calculated by standard methods [2] using the experimentally determined volumetric dose H_V to inactivate various types of microorganisms. The disadvantage of this approach is that the volume dose H_V depends on the geometry of the camera for exposure and degree of mixing water during irradiation in laminar flow. To obtain the required dose of disinfection H_S , the size of the camera for radiation (diameter and length) should provide the required minimum radiation $E_{\min}$. Other areas will receive "excessive" exposure that only increases the reliability of disinfection.
The required dose H_S (W·cm^2) is achieved variation $E_{\min}$ (W·m^2) or time t (s):

$$H_S = E_{\min} \cdot t \tag{1}$$

Plant capacity for disinfection process is determined from the equation

$$V = \frac{E_2 \cdot l \cdot \pi \cdot R_1 \cdot e^{-k(R_1 - R_2)}}{H_S R_2} \left(R_2^2 - R_1^2\right) \tag{2}$$

Under these conditions, even in the case of laminar flow (when layers of water do not mix), layers of water that are far from the ultraviolet lamp, will receive the required dose for inactivation.

References

[1] A. Semenov and G. Kozhushko. Bactericidal irradiators for ultraviolet disinfection of indoor air, *European Applied Sciences*, **1(13)**, 226-228 (2013).
[2] A. Silva, N. Filho, M. Palha and S. Sarmento. Kinetics of water disinfection using UV-C radiation, *Fuel,* **110**, 114-123 (2013).

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