

عنوان مقاله:

Development of a radiation model for the CFD simulation of UV-LED water disinfection reactors

محل انتشار:

سی و یکمین همایش سالانه بین المللی مهندسی مکانیک ایران و نهمین همایش صنعت نیروگاهی ایران (سال: 1402)

تعداد صفحات اصل مقاله: 5

نویسندگان:

;Ali Salehi - M.Sc. student School of Mechanical Engineering, College of Engineering, University of Tehran, Tehran

Alireza Jalali - Assistant professor, School of Mechanical Engineering, College of Engineering, University of Tehran, Tehran

خلاصه مقاله:

The disinfection process generally involves two types: physical and chemical processes. In the past, chlorine gas was the most commonly used disinfection method (chemical method). Using chlorine as a disinfectant will result in the production of byproducts in water, and the presence of these substances in water poses a health risk to humans. Nowadays, physical methods have gained increasing popularity because of the destructive effects of chemical methods. Ultraviolet (UV) radiation is one of the most effective physical methods for the inactivation of microorganisms. Traditionally, UV reactors equipped with an ultraviolet lamp source have been used to produce ultraviolet rays. Water poisoning is always a concern with ultraviolet lamps because they contain mercury and are fragile. Due to the disadvantages of ultraviolet lamps and the progress of semiconductor technology, ultraviolet light emitting diodes (LEDs) are being studied more and more. In this research, a radiation model is developed to simulate the intensity of UV radiation within UV-LED water purification reactors. In particular, the radiation pattern of an UV-LED in a U-shaped photoreactor will be investigated. This model considers the LED as a point light source. The radiation pattern of the LED is determined by using the radiation intensity diagram, fitting a curve to it, and using the discrete ordinate method. Finally, the obtained information will be verified and using the data available in the literature

کلمات کلیدی:

Disinfection, ultraviolet light emitting diodes (UV-LEDs), photoreactor, radiation intensity

لینک ثابت مقاله در پایگاه سیویلیکا:

<https://civilica.com/doc/1668614>

