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Perspective

Techniques for Water Treatment by Using Irradiation and Biofilm Resistance

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DESCRIPTION

The Ultraviolet (UV) irradiation has emerged a viable alternative for water/wastewater disinfection. The effect of temperature for performance and kinetics of the UV disinfection process was investigated by using a single lamp annular UV reactor. The increase in consumption of energy with the improving of living standards means the supply of energy resources will reach its limit more rapidly.

The biofilms are ubiquitous in water bodies and most of the UV disinfection research is focused on planktonic a bacterium, that is limited to the attention that has been paid to UV irradiation. The Domestic Waste Water (DWW) contains large number of pathogenic viruses which are not significantly reduced in most of the waste water treatment processes and are found at high in numbers and conventionally disinfected. The reactor was operated to disinfect the secondary treated domestic wastewater.

It provides an overview for the application of UV and for the biofilm control in water and wastewater infrastructure. The sewage treatment in the plant is considered as a key node in ARG control, and it is the utmost importance to elucidate the effects and mechanisms of each process, especially disinfection. In this study, the three disinfection methods (ultraviolet, chlorination, and ozone) were used to reduce the concentration of ARGs in secondary effluents from municipal sewage treatment of plants.

It summarizes that the development of UV light resources which are ranging from conventional mercury lamps to Light Emitting Diodes (LEDs) and biofilm resistance mechanisms leads to UV. In Advance the Oxidation Process (AOPs) shows an approach to meet the specific objectives of Municipal Waste Water treatment (MWW).

Especially in agriculture, the demand for fresh water is increasing, so water treatment and reuse is very essential. The comprehensive analyses of biofilm-targeting in the UV technologies are currently in the use or potentially useful for water management, which are following a comparative analysis on single/multiple wavelength, continuous/pulsed irradiation, and immediate/chronic disinfection efficacy evaluation is also provided.

Therefore, this study evaluated the effect of UV dose on turbidity and microbial inactivation of wastewater treated at the UFSCar/Araras Wastewater Treatment Station (ETE). The antibiotic resistance in wastewater is becoming a major public health concern, but the impact of disinfection on antibiotic-resistant bacteria and antibiotic resistance genes is poorly understood.

Most of the chemical pollutants in wastewater can be effectively removed in conventional treatment process, but the pathogenic microorganisms can only be removed partially, which often fails to meet the hygiene safety requirements, and further disinfection also still required.

In this study, the secondary wastewater effluent bench-scale disinfection efficacy experiments with two different Per-Acetic Acid (PAA) formulations (15 and 22% per-acetic acid) and low-pressure ultraviolet irradiation. Next, the potential for controlling biofilms with UV is discussed from the perspective of three technical routes that causing biofilm deposition, inhibiting biofilm formation, and inhibiting bacterial disinfection within established biofilms activation.

CONCLUSION

The UV disinfection of antibiotic-resistant heterotrophic bacteria and their associated genes in wastewater from a municipal sewage treatment plant was evaluated. Environmental Antibiotic Resistance Genes (ARGs) have recently become an increasing concern due to the damage inflicted on the environment and humans. Two commonly used antibiotics, erythromycin and tetracycline, were chosen because of their widespread use in addressing the problem of antibiotic resistance. At present, the common method of sewage disinfection includes chemical and physical methods.

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