Wastewater Disinfection by Titanium Dioxide (Tio_2) Solar Photocatalysis

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ABSTRACT

The tasks of achieving suitable wastewater disinfection without formation of dangerous disinfection by products by chemical disinfectants, as well as increasing need for a versatile wastewater disinfection and reuse systems demands for new technologies for efficient disinfection and microbial control. Titanium dioxide(TiO_2) a metal oxide semiconductor nonmaterial has proved strong antibacterial, antiviral and antifungal properties through diverse mechanism of photo catalytic production of reactive hydroxyl and oxygen species on their surfaces in the presence of solar photons hv which inhibit enzyme activity and DNA synthesis, damages the bacterial cell components and viruses in wastewater that contains these pathogenic agents. This paper reviews the antimicrobial mechanisms and the disinfection efficiency of Titanium dioxide TiO_2 nanoparticle, discusses their merits, limitations and applicability for wastewater disinfection, and highlights research needs by involving more people in order to exploit innovative TiO_2 nanomaterial in wastewater disinfection.

Keywords: Wastewater, disinfection, Titanium Dioxide.