Ozonation of wastewater in Algeria by dielectric barrier discharge

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ABSTRACT

The oxidation by ozone is considered as being an effective solution and offers irrefutable advantages in wastewater treatment. Ozone is used to treat different types of water due to its effectiveness in water purification and for its oxidation potential. This process of ozonation becomes progressively as an alternative technology and is inscribed in a sustainable development perspective, in particular in Algeria, where other conventional techniques of treatment are used in comparison to the latter, which is often used in Europe. Our work describes this process of treatment using the ozone produced by dielectric barrier discharges (DBD), which are fed by a high voltage of several thousands of volts. So, we conceived and accomplished a new generator of ozone DBD of cylindrical form, which will be used for wastewater treatment (WWTP) of Mascara, west of Algeria. Our experimental results have revealed the effectiveness of this type of treatment on the basis of physico-chemical analysis (pH, turbidity, chemical oxygen demand, biological oxygen demand and oxidizable matter) and bacteriological (total coliforms, fecal coliforms, Escherichia coli and Salmonella) upstream and downstream of the WWTP which presents a very high rate of elimination of all the parameters, particularly for the turbidity and bacteria in a very effective manner.

Keywords: Wastewater; Treatment; Oxidation; High voltage; DBD generator; Ozone

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