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INTEGRATED TREATMENT OF LEACHATE FROM MUNICIPAL WASTE SOLID LANDFILL

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Abstract

The present paper proposes an integrated-treatment process of leachate from a municipal landfill, which involves two treatment steps. The first step consists in diminishing the organic content through an advanced oxidation process using ozone and hydrogen peroxide. The second step is performed in order to diminish the content of heavy metals through a sorption process on a natural low-cost biosorbent, thus the traces of organic substances remained after oxidative degradation or oxidation-intermediate products are removed. From the point of view of the oxidative process of organic substances in the leachate can be mentioned the simultaneous action of two strong oxidants such as ozone. A mineralization rate related to COD-Cr of around 20 % is obtained after approximately four hours of pretreatment using an ozone generator with a productivity of 0.5 g Ozone corresponding to an energy consumption less than 1kWh. At the same time, a maximum 65 % decolorization is achieved. Using moss peat from Poiana Stampei (Romania) as biosorbent, removal rates of 95% is achieved in case of leachate solution containing 2.19 mg/L of copper ions. In relation to the organic content, the sorption treatment rates ranges between 12 and 18%, which correspond to a total organic content of 770 mg O₂/L.

Key words: advanced oxidation processes, leachate, ozonization, sorption, wastewater treatment

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