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COMPARATIVE STUDIES ON KINETICS OF ANAEROBIC AND AEROBIC BIODEGRADATION OF LIPIDS FROM OLIVE OIL MILL WASTEWATERS WITH MIXTURE OF *Bacillus spp.* CELLS

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Abstract

The experiments on the olive oil mill wastewater treatment for removing the lipids by anaerobic and aerobic biodegradation with mixed *Bacillus spp.* culture indicated that the rate of the aerobic process is up to two times higher than that of the anaerobic one. In this context, it was found that the influence of the dissolved oxygen concentration on the lipids biodegradation process is significant, but the kinetic model given in literature does not consider this parameter. Therefore, using the dependence between the ratio of specific rates, for aerobic and anaerobic processes, and the concentration of oxygen dissolved in medium, the new model $-\frac{dC_{TL}}{dt} = k_d \cdot C_{O_2}^{0.62} \cdot C_{TL}$ was established for describing the kinetics of aerobic biodegradation with *Bacillus spp.* This model is more adequate for the studied systems of lipids-rich wastewaters bacterial treatment, offering the maximum error of 12.6% and the average one of $\pm 6.84\%$.

Key words: *Bacillus spp.*, biodegradation, kinetics, lipids, specific rate

Received: November, 2014; Revised final: March, 2015; Accepted: March, 2015
