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STUDY OF THE GLYPHOSATE-AMINE PESTICIDE MINERALIZATION IN WASTEWATER BY OZONATION TREATMENT

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Abstract

The main objective of the research was to study the efficiency of the glyphosate amine pesticide mineralization in wastewaters (real and model type of wastewaters respectively) using ozonation treatment as an advanced oxidation processes (AOP). The wastewater samples (model wastewater) were obtained by mixing a given volume of the stock solution prepared from glyphosate isopropyl-amine in different volumetric ratios with distillated water and with real wastewater obtained from a domestic wastewater plant, respectively. In case of model wastewater, the decomposition of glyphosate isopropyl-amine salt into ortophosphate, nitrite-, nitrate-ions and carbon dioxide products was studied. The efficiency of the oxidation process was determined by material balance calculations in terms of residual organic content, experimentally determined by COD_{Cr} method. During the experiments the changes of the chemical composition, due to the mineralization processes occurring in the model wastewater were monitored. The decomposition of the glyphosate isopropyl-amine was followed by analytical techniques in function of time. Mineralization efficiency of 13-14 % was achieved during the experiments carried out with model wastewater. The outcome of the experiments was used for a small-scale Hungarian wastewater plant having a capacity of 7,100 population equivalent. In case of real effluent mineralization efficiency of 30 % was achieved. Based on the experimental results, it can be concluded that the ozonation treatment significantly increases the mineralization efficiency of model pesticide.

Key words: wastewater treatment, micropollutants, glyphosate-amine pesticide, ozonation treatment, advanced oxidation processes (AOP)

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