

**Lobos-Moysa, E., Dudziak, M., Bodzek, M. Effect of Fatty Acids and Sterols on the Efficiency of Wastewater Treatment by the Activated Sludge Process in a Batch System. *Ochrona Srodowiska* 2010, Vol. 32, No. 2, pp. 53–56.**

**Abstract:** The experiments were conducted in a batch system, with a mixed microbial population of the activated sludge obtained from a municipal sewage treatment plant. The extent of biodegradation for the polluting species occurring both in the model and real wastewaters was established taking into account the variations in the content of specific pollutants, *i.e.* unsaturated fatty acids (linoleic – C18:2 and oleinic – C18:1), saturated fatty acid (palmitic – C16:0) and sterols (stigmasterol,  $\beta$ -sitosterol and betuline). The study produced the following findings. Removal of linoleic acid was complete with both types of wastewater. As for the other pollutants, differences were observed in the removal patterns between the two wastewater types: *e.g.*, for oleinic acid the efficiency of removal varied from 68 to 93% in the case of the model wastewater, and from 90 to 91% in the case of the municipal sewage. Palmitic acid was an exception: its removal achieved during biodegradation of the model wastewater with no oil additive only varied between 32 and 44%. The difference in the efficiency of removal can be attributed to the readiness of unsaturated acids to undergo oxidation with the increase in the number of double bonds. The extent of biodegradation was also found to depend on the initial concentrations of the fatty acids and on the load of pollutants received by the activated sludge. In the case of sterols, whose concentrations were noticeably lower than those of fatty acids, no such relation was found to occur. Seemingly, the principal mechanism governing the removal of sterols involved adsorption and bio-accumulation.

**Keywords:** Wastewater treatment, aerobic process, activated sludge, edible oil, fatty acids, sterols.