

Lobos-Moysa, E., Bodzek, M., Kopytiuk, M., Mateja, M. Effect of Vegetable Oil on the Efficiency of Wastewater Treatment by the Activated Sludge Method. *Ochrona Srodowiska* 2008, Vol. 30, No. 4, pp. 35–38.

Abstract: The paper addresses the problem of how the presence of edible vegetable oil in the wastewater affects the biological treatment process involving activated sludge. The experiments were conducted under aerobic conditions in a batch reactor and a flow reactor, at a BOD₅ loading of the activated sludge (dry solids) varying from 0.03 to 0.25 gO₂/g·d. Sludge samples were collected at a municipal sewage treatment plant in the Silesian District. The water samples being treated contained model sewage (prepared on the basis of enriched broth) and actual sewage from the municipal sewage treatment plant mentioned. All the samples were added rapeseed oil in the form of emulsion. The experiments have revealed a reduction in the efficiency of treatment when rapeseed oil was present in the samples, regardless of the method with which the process was conducted. Biodegradation of the sewage where rapeseed oil was absent produced a COD removal efficiency of 93 to 95% and 89 to 95% for the model sewage and actual sewage, respectively, both in the batch and in the flow system. Upon addition of the vegetable oil, the efficiency of COD removal was lower and totalled 86 to 92% and 80 to 85%, respectively. The extent of reduction in TOC was also found to be lower in the presence of the oil, and in most instances failed to exceed 90%. As for BOD₅, the removal efficiency was lower only when the process was conducted in the flow reactor. There is a real risk that during operation of the sewage treatment plant, under conditions of an emergency discharge of oil-contaminated wastewater, the non-biodegraded oils or the products of their biodegradation will enter the natural recipient. Thus, when assessing the biological treatment of wastewaters that contain oils or fats, it is necessary to take into account the pollutants specific to these food products (*e.g.* sterols or fatty acids), in order to determine the effect of the pollutants on the course of the activated sludge process and on the biodegradation of the oils.

Keywords: Wastewater treatment, activated sludge, vegetable oil.