

## Summary

The occurrence of aromatic hydrocarbons such as benzene, toluene and xylenes (BTX) in municipal sewage and their toxic effect on living organisms highlights the problem of obtaining the effective elimination of the substances in biological wastewater treatment process. This follows from the fact that in many cases achieved incomplete removal of these substances, leading to their discharge into receiver. Removal of BTX from sewage by biochemical processes is the result of biological activity of activated sludge microorganisms. The processes also are accompanied by physical processes, such as release into the atmosphere, and adsorption on activated sludge particles. Efficient municipal wastewater treatment is currently based mostly on the proper combination of processes in different conditions of oxidation-reduction potential, from the conditions of strictly anaerobic, anoxic to the aerobic. The study highlighted the importance of anaerobic processes for the removal efficiency of specific organic substances – the aromatic hydrocarbons BTX in an activated sludge process and the total content of organic matter present in sewage, defined as COD. Also determined the effectiveness of the biological dephosphatation and ammonia nitrogen oxidation in the conditions of occurrence of elevated BTX concentrations. The study was conducted for the approved scope of individual BTX concentration from 250 to 2000  $\mu\text{g}/\text{dm}^3$ . Stated that under anaerobic activated sludge process, BTX removal from sewage were in the range from 37,5 to 85,8% . The sewage treatment in such conditions can limit release of the aromatic hydrocarbons into the atmosphere, caused by aeration. For the BTX removal from sewage the adsorption on activated sludge particles under anaerobic conditions plays a very important role. The hydrocarbons adsorption was diverse and had has a value ranging from 16,5 to 45,2% of the initial concentration. The study showed that low organic load are necessary and have a very significant impact on the effectiveness of treatment, both in relation to the removal of organic compounds, as well as nutrients. In the most common in the influent BTX concentrations (0.03 do 1.0  $\text{mg}/\text{dm}^3$ ), they cause no significant restrictions on removal efficiency of organic pollutants (COD) and nutrients – N and P. The negative impact was revealed clearly in the presence of higher (abnormal) BTX concentrations above 2.0  $\text{mg}/\text{dm}^3$ . Under such conditions, BTX significantly decreased the removal efficiency of organic compounds,

measured as COD and ammonia nitrogen oxidation. In the case of low-loaded sewage BTX and their cleavage products of anaerobic degradation in activated sludge process are a supplementary source of organic matter for phosphorus accumulating bacteria. The higher effect of dephosphatation was obtained for sewage treatment containing aromatic hydrocarbons.