EFFICIENCY OF BIOGENIC COMPOUNDS REMOVAL IN A SAND FILTERS WITH HORIZONTAL FLOW

Key words: biogenic compounds, domestic sewage, efficiency of treatment, sand filter

Summary

The paper presents the results of the efficiency of biogenic compounds removal in a sand filters. The investigations were carried out on a model wastewater treatment plant consisting of a preliminary sedimentation tank and two sand filters with a horizontal flow of wastewater. The efficiency of ammonia nitrogen, total nitrogen and total phosphorus removal was analyzed for wastewater hydraulic loads: $Q_1 = 1.44; Q_2 = 1.08; Q_3 = 0.72 \text{ dm}^3\text{d}^{-1}$ on the aerobic (I) and anaerobic (II) bed. The best efficiency of ammonium nitrogen (37%) and total nitrogen (39%) removal was obtained with the $Q_2$ hydraulic load, whereas for phosphorus (69%) was it by the $Q_3$ hydraulic load. I has been observed that the best effects of total nitrogen, ammonium nitrogen and total phosphorus removal were achieved usually in the aerobic bed I but it was worse in the anaerobic bed II. It has been shown that sand filters with a horizontal flow provide a small efficiency of biogenic substances and thus should not be used for sewage treatment since they may pollute groundwater or surface water. The main reason of a small efficiency of ammonium removal in such systems is the lack of oxygen in the treated sewage and that is why the processes of biological removal of nitrogen compounds do not proceed appropriately.