

Summary

The aim of this work is purification of contaminated soil from manufactured gas plants (MGP), which are not used. Prepared chromatographic methodologies, which allow qualitative identification and quantitative determination of individual aliphatic and aromatic (TAH, PAH) hydrocarbons in the soil from the selected MGP, are presented. The results of the research on remediation of the soil polluted with petroleum hydrocarbons (TAH, PAHs) in semi-field conditions are discussed. Application of basic bioremediation and bioaugmentation with indigenous microorganisms, enriched with PAH biodegradable fungi, resulted in reduction in amount of 5- and 6-polycyclic aromatic hydrocarbons. The research enables control of remediation progress, selection of optimal doses of biogenic compounds and determines the time of the process. The entire cycle of soil remediation was monitored with the use of gas chromatography (GC). Estimation of biodegradation degree of individual aliphatic hydrocarbons (alkanes) was based on changes in their concentration in the soil and determined by biodegradation indicators: C₁₇/pristane and C₁₈/phytane ratios. Attention was paid particularly to biodegradation of polycyclic aromatic hydrocarbons (PAH), which were observed in substantial concentrations in the polluted soil. The elaborated chromatographic methodology of PAH determination in the soil enabled estimation of a biodegradation rate referring to individual compounds. Moreover, attempts to create a TAH biodegradation model with the use of C₃₀-17 α (H),21 β (H)-hopane were undertaken.