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Purification of filtering drainage wastewater of solid waste landfills with modified coagulant solutions

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Abstract

This article presents the experimental studies results of the filtering drainage wastewater purification of solid waste landfills with modified reagent solutions. Experimental studies were conducted at solid waste landfills in Ukrainian cities. Modification of the coagulant solution was conducted in a special device, which provides for the creation of ionic associates resulting from magnetic treatment and their fixation with anodically dissolved iron. The effect of the modified coagulant solution was substantiated theoretically at the wastewater treatment process. The effect of the modified coagulant solution was studied to the granular medium protective effect increase and the time of the limiting head losses reach at rapid filters during the filtrate tertiary treatment of solid waste landfills. It was found that the modified coagulant solution use makes it possible to intensify the processes of wastewater treatment in solid waste landfills by an average of 25–30%. The dependence of predicting the changes in biochemical oxygen demand of treated

wastewater was proposed to confirm the technological procedure for the filtration wastewater purification from solid waste landfills using a modified coagulant solution and biodisks.

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Contributions

Conceptualization: [Stanislav Dushkin, Serhii Martynov]; Data curation: [Stanislav Dushkin, Serhii Martynov, Stanislav S. Dushkin, Marya Degtyar]; Formal analysis: [Stanislav Dushkin, Serhii Martynov, Stanislav S. Dushkin, Marya Degtyar]; Funding acquisition: [not applicable]; Investigation: [Stanislav Dushkin, Marya Degtyar]; Methodology: [Stanislav Dushkin, Serhii Martynov, Stanislav S. Dushkin, Marya Degtyar]; Project administration: [Stanislav Dushkin, Serhii Martynov]; Resources: [Stanislav S. Dushkin, Marya Degtyar]; Software: [not applicable]; Supervision: [Stanislav Dushkin]; Validation: [Stanislav Dushkin, Marya Degtyar]; Visualization: [Serhii Martynov, Marya Degtyar]; Writing – original draft: [Stanislav Dushkin, Serhii Martynov, Stanislav S. Dushkin, Marya Degtyar]; Writing – review & editing: [Serhii Martynov, Stanislav S. Dushkin].

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Ethics declarations

Conflict of interest

The authors declare that they have no competing interests.

Data Availability

The full data that support the findings of this study are available from the corresponding author, [Stanislav Dushkin], upon reasonable request.

Ethical approval

This article does not contain any studies with human participants or animals performed by any of the authors.

Additional information

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