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Utilization of Solid Waste from Landfill Passive Zone to Treat Leachate Through A Combination of Leachate Recirculation and Bulking Agent

[Využití pevného odpadu z pasivní zóny skládky do upraveného výluhu kombinací recirkulace výluhu a objemového činidla]

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Real evidence of the Municipal Solid Waste (MSW) decomposition process is the emergence of pollutants as leachate, which has a chemical composition that is difficult to degrade (recalcitrant compounds) and causes pollution of water bodies. On the other hand, waste from the passive zone landfill is not utilized at all. The aim of this study was to determine the effect of adding solid waste from landfill passive zone as bulking agent to treat fresh leachate with a combination of the recirculation process. MSW + bulking agent (70%: 30%, v/v) was recirculated using fresh leachate with a flow rate of 1 L/min for 30 days. Reactor without recirculation and bulking agent was used as control.

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MSW stabilization in an anaerobic bioreactor landfill and evaluation of in-situ leachate treatment potential with the help of quadric model

Nain, A. , Lohchab, R.K. , Singh, K. (2021) *Journal of Material Cycles and Waste Management*

Effect of leachate recirculation and bulking agent on leachate quality

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The leachate quality was analyzed on days 0, 3th, 7th, 14th, and 30th, while the MSW composition was controlled after being left for 365 days. The outcome of the results obtained from the experiment showed that the addition of bulking agent + recirculation accelerated the increase in leachate pH and the increment of COD reduction. On day 30th, the lowest TDS level presented 63,813.8 mg/L, the conductivity was 111,457.5 $\mu\text{S}/\text{cm}$, and the ammonia showed 72.5 mg/L produced from R3 (MSW + bulking agent + recirculation). The addition of bulking agents from passive landfill zones can reduce COD, TDS, conductivity and ammonium. On the 365th day, the water content of MSW in R3 was 76.8%, pH value get 7.7, EC value presented 43.4 mS/cm and volatile solid achieved 94.99%. The same increase occurred in the total Nitrogen at R3 from 0.23% to 0.95%. Meanwhile, the levels of P-Total and K-Total did not change significantly. © 2022 Czech Environment Management Center. All rights reserved.


Author keywords

Bulking agent; COD; Landfill; Leachate; MSW; Recirculation; Solid waste

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