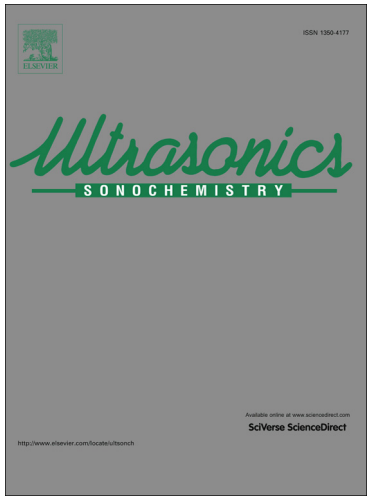

Repeatedly using the decomposition product of struvite by ultrasound stripping to remove ammonia nitrogen from landfill leachate

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Repeatedly using the decomposition product of struvite by ultrasound stripping to remove ammonia nitrogen from landfill leachate

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Abstract: In this study, the decomposition of struvite by ultrasound stripping and the recycle use of the decomposition product for the treatment of landfill leachate were investigated. The results indicated that when the decomposition of struvite by ultrasound stripping was performed at 55°C for 40 min, the ammonium in the struvite could be almost completely eliminated from the solution system. The characterization analysis showed that magnesium phosphate and the dissolved phosphate ions were the main active derivatives. Approximately 90% of the total ammonia nitrogen (TAN) in landfill leachate can be removed by reusing the decomposition product at pH 9 for 60 min. Repeated use of the struvite decomposition product revealed that the TAN removal efficiency decreased with an increase in the number of recycles. However, in the process of multiple recycling, about 90% of TAN removal could be maintained by supplementing a certain amount of the preformed struvite to the solution for every recycle. An economic analysis demonstrated that 79.3% of the treatment cost could be saved by the proposed process compared to the non-recycling process.

Keywords: landfill leachate, ammonia nitrogen, struvite, ultrasound stripping, recycling.

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