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Evaluation of Sustainable Scrubbing Agents for Ammonia Recovery from Anaerobic Digestate

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Abstract

Organic acids (citric and acetic), chilled water, epsom and gypsum were tested for ammonia recovery from anaerobic digestate in a bench-scale stripping-scrubbing experimental setup. Citric acid was found to give excellent scrubbing performance equivalent to that of sulfuric acid but required double the acid dosage due to its partial dissociation characteristics. Acetic acid performed satisfactorily at low temperature and was susceptible to vaporization due to stripping effect in the scrubbing unit, while the other three scrubbing agents were found to be ineffective. Economic and safety comparisons among the acids demonstrated that citric acid could be feasible for full-scale applications given competitive material cost and an expended organic fertilizer market.

Keywords: ammonia recovery, anaerobic digestate, air stripping, acid scrubbing, fertilizer

1. Introduction

The global waste management crisis and critical eutrophication of sensitive water-receiving bodies across the world are key drivers to remodeling conventional wastewater treatment

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