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Review

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Approaches and processes for ammonia removal from side-streams of municipal effluent treatment plants

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ABSTRACT

The main objective of this review article is to provide a comprehensive view on various conventional and emerging side-stream ammonia removal treatment options for municipal wastewater treatment plants (WWTPs). Optimization of wastewater treatment facilities from an energy and emissions stand-point necessitates consideration of the impact of the various internal side-streams. Side-streams from anaerobic sludge digesters in particular have the potential to be a significant ammonium load to the mainstream treatment process. However, the literature suggests that managing side-streams through their treatment in the mainstream process is not the most energy efficient approach, nor does it allow for practical recovery of nutrients. Furthermore, as effluent criteria become more stringent in some jurisdictions and sludge hydrolysis pre-treatment for digesters more common, an understanding of treatment options for ammonia in digester supernatant becomes more important. Given these considerations, a variety of side-stream treatment processes described in the literature are reviewed.

Keywords: Side-stream treatment; anaerobic digestion; ammonia removal; nutrient recovery; wastewater

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