

Phosphorus recovery from anaerobically digested liquor of screenings

Abstract

Phosphorus is a limited resource which is predicted to get exhausted at some point during the twenty-first century. However, it is present in wastewaters at concentrations that come close to supplying the nation's annual requirements for fertiliser. Many papers have addressed the recovery of phosphorus as struvite (magnesium ammonium phosphate hexahydrate) from different types of waste while the most prominent usage of struvite is as a slow-release fertiliser, suitable as a replacement for chemical fertiliser, for agricultural application. In this study, screenings produced during the wastewater treatment process were anaerobically digested to obtain anaerobically digested liquor which was subsequently used for phosphorus recovery in the form of struvite. This was carried out at different concentrations of dry solids. The amount of struvite potential was calculated theoretically using molar ratio calculations of 1:1:1 (Mg:N:P). From the results, it was found that the digestate is high in phosphorus content and can be recovered up to 41%. For struvite yield, 0.27,kg of struvite can be recovered from each kg dry solids of screenings from 3% of dry solids. Screenings thus prove a valuable source of additional phosphorus which current disposal practices fail to exploit.