

## **Pre-treatment of ammonia-nitrogen (NH<sub>3</sub>-N) removal from scheduled waste leachate by air stripping**

### **ABSTRACT**

The effect of lime dosage, pH and air flow rate on the removal process of NH<sub>3</sub> –N from a scheduled waste landfill leachate was investigated by using a lab-scale air stripping column. The main objectives were to reduce NH<sub>3</sub> –N concentration prior further biological treatment and to investigate factors affecting air stripping processes. A central composite design (CCD) of response surface methodology (RSM) was employed to optimize the parameters affecting NH<sub>3</sub> –N removal from the leachate. It was observed that the optimal conditions obtained from desirable response (NH<sub>3</sub> –N removal) were predicted at lime dosage of 9.8 g L<sup>-1</sup>, pH = 11 and air flow rate of 2.25 L min<sup>-1</sup>. Quadratic RSM predicted the maximum NH<sub>3</sub> –N removal to be 96.5% at these optimal conditions and concurred with the experiments which successfully removed 96.3% of NH<sub>3</sub> –N within 24 h. This study shows that the RSM could successfully predict the degree of NH<sub>3</sub> –N removal. The findings suggest that RSM approach was feasible for optimizing the air stripping process for NH<sub>3</sub> –N removal from scheduled waste landfill leachate in laboratory scale. Based on the obtained results, air stripping process can be used as an efficient pre-treatment for removal of NH<sub>3</sub> –N in scheduled waste leachate.

**Keyword:** Air stripping; Ammonia-nitrogen removal; Leachate; Response surface methodology (RSM); Scheduled waste leachate