Comparison of lime powder and caustic soda as a pre-treatment for ammonia-nitrogen removal from a scheduled waste leachate

ABSTRACT

Studies on leachate taken from scheduled waste landfill are limited. This might be due to the complex characteristics of the leachate from scheduled waste landfill compared to other types of landfills. Leachate is known as a strong wastewater in terms of its organic matter and ammonia content. In this study, a pre-treatment on the removal of ammonia-nitrogen (NH3-N) by coagulation on a leachate sample taken from a Scheduled Waste Landfill (SWL) is reported. The coagulation was performed using lime (Ca (OH)2), and caustic soda (NaOH) with varying pH and amount of coagulant. A different dosage of Ca (OH)2, and NaOH was applied and the removal efficiency using both coagulants were investigated to find the most optimum dosage for NH3-N removal. Results showed that the percentage of NH3-N removal was relatively the same for both Ca (OH)2 and NaOH which was up to 45% and 48%, respectively. The optimum pH and dosage of coagulant for the removal process using Ca (OH)2 was pH=12.40±0.02 and 6gLī 1, respectively while with NaOH was pH=12.83±0.02 and 8 gLī 1, respectively. A small difference in the removal of NH3-N with a less dosage of coagulant used in the study suggests that lime (Ca(OH)2), is a better choice for the pre-treatment process.

Keyword: Ammonia-nitrogen; Caustic soda; Leachate; Lime; Scheduled waste