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REMOVAL OF NH_4^+-N FROM AQUEOUS SOLUTION BY CERAMSITE COATED WITH $Mg(OH)_2$ COMBINED WITH AIR STRIPPING

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Abstract

Removal of excessive ammonium nitrogen (NH^+_4-N) from aqueous solution has been of considerable concern for several decades. It can be removed by air stripping, a necessary prerequisite is adding enough alkali. This study presented the first attempt to investigate the potential use of ceramsite coated with magnesium hydroxide (CCMH) on the effectiveness of NH^+_4-N removal coupled with air stripping at ambient temperature without alkali addition. The results showed that the CCMH coupled with air stripping process has the highest NH^+_4-N removal efficiency, after stripping for 150 min, the removal rates were 86.4%, 90.7% and 93.8% at pH 3, 7 and 11, respectively. This demonstrated that in acidic condition, the combined process still had high removal efficiency. It was further determined that the changes of initial pH had no significant effect on the NH^+_4-N removal. As air flow rate increased, the removal rate of NH^+_4-N naturally increased. Besides, the removal rates of NH^+_4-N followed the general first-order model in the investigated initial pH and air flow rates, with the general first-order rate constants rapidly increased. In conclusion, the combined process can be considered as a promising method for the removal of NH_4^+-N from aqueous solution, having high removal efficiency, pH value adjustment free and the stripped ammonia can be absorbed without secondary pollution.

Key words: air stripping, ammoniun nitrogen, ceramsite, magnesium hydroxide

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