Denitrification of aging biogas slurry from livestock farm by photosynthetic bacteria

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Denitrification of aging biogas slurry from livestock farm by photosynthetic bacteria

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Abstract: Huge amount of aging biogas slurry is in urgent need to be treated properly. However, due to high NH_3-N concentration and low C/N ratio, this aging biogas slurry is refractory for traditional methods. Its denitrification has become a big challenge. In this paper, photosynthetic bacteria (PSB) were employed to handle this problem. The results showed denitrification of aging biogas slurry by PSB treatment was promising. The highest removal efficiency of NH_3-N reached 99.75%, much higher than all other treatments. The removal of NH_3-N followed pseudo zero order reaction under dark-aerobic condition. The better inoculation rate for NH_3-N removal was 30%; and aerobic condition was more beneficial for NH_3-N removal than anaerobic condition because of different metabolic pathways.

Key words: photosynthetic bacteria; aging biogas slurry; denitrification; process factor.

1. Introduction

Livestock and poultry breeding are developing rapidly in the world. In China, hoggeries were more than 100 million in 2015 (Li et al., 2015). With the fast development, treatment of large amount of manure has become an increasingly serious problem. Anaerobic fermentation

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