猪粪沼液中氨态氮含量的影响因素实验研究

Influence of fermentation conditions on the content of ammonia nitrogen in anaerobic fermentation slurry

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英文关键词：pig dejecta; anaerobic fermentation slurry; ammonia nitrogen; anaerobic fermentation conditions

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作者	单位
张全国	河南农业大学机电工程学院，郑州 450002
杨群发	河南农业大学机电工程学院，郑州 450002
李随亮	河南农业大学机电工程学院，郑州 450002
范振山	河南农业大学机电工程学院，郑州 450002

中文摘要：

通过猪粪在不同工艺条件下的厌氧发酵实验，研究了以猪粪为发酵原料所产沼液中氨态氮含量的各种影响因素及其最优发酵工艺技术。沼液中的氨态氮含量随发酵时间呈增长趋势，发酵温度为15℃时的增长速度缓慢，而发酵温度为30℃以上时的增长明显加速，适宜的搅拌速度和较高的原料浓度也有利于氨态氮含量的迅速增加。并且，pH值对沼液中的氨态氮含量有较大影响，发酵液呈酸性时的沼液中氨态氮含量随发酵时间逐渐减少，而碱性发酵液的沼液中氨态氮含量随发酵时间不断增加。沼液中氨态氮含量达到最大时的可控发酵工艺条件为：发酵时间，5 d；发酵温度：30℃；原料浓度，3.7%。

英文摘要：

The content of ammonia nitrogen in anaerobic fermentation slurry produced from swine manure was measured to determine how the changes of fermentation conditions affect it. The results of experiments showed that the content of ammonia nitrogen in anaerobic fermentation slurry increased slowly with the increase of fermentation time when fermentation temperature was 15℃, and the content of ammonia nitrogen in anaerobic fermentation slurry increased quickly with the increase of fermentation time at 30℃ and 55℃. High material concentration was in favor of the rapid increase of ammonia nitrogen. Stir was in favor of the rapid increase of the content of ammonia nitrogen. Inoculation could promote the rapid increase of ammonia nitrogen in 1～2 days of fermentation. The content of ammonia nitrogen tended to decrease when pH value was 5, and the content of ammonia nitrogen tended to increase at pH 7 and pH 8.5. The optimization experiment indicated that material concentration was the most notable factor influencing the content of ammonia nitrogen. When fermentation time was 5 days, fermentation temperature was 30℃ and material concentration was 3.7%, the content of ammonia nitrogen was the highest.

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