

潘云霞,李文涛,刘爽,李文哲.高温复合菌系WSC-6预处理稻秆对沼气生产的影响[J].农业工程学报,2012,28(6):228-232

高温复合菌系WSC-6预处理稻秆对沼气生产的影响

Effect of pretreatment with high-temperature composite strains WSC-6 on biogas production of rice straw

投稿时间: 2011-07-07 最后修改时间: 2011-11-25

中文关键词: [稻秆](#), [粪便](#), [降解](#), [高温复合菌系WSC-6](#), [生物预处理](#), [猪粪](#)

英文关键词: [straw](#) [manures](#) [degradation](#) [high-temperature composite strains WSC-6](#) [biological pretreatment](#) [swine manure](#)

基金项目: “十二五” 国家科技支撑计划项目 (2011BAD15B00); 西南大学博士基金项目 (SWUB2008065); 中央高校基本科研业务费专项资金项目 (XDJK2009C003)。

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中文摘要:

为提高稻秆在沼气生产中的水解酸化效率, 寻求复合菌系WSC-6生长的廉价氮源, 降低稻秆酸化水解的运行成本, 该试验利用高温复合菌系WSC-6, 以未经处理的稻秆为碳源, 分别以新鲜猪粪和干猪粪为氮源, 对稻秆进行生物预处理。研究表明, 高温复合菌系WSC-6对新鲜猪粪中的氮源利用更充分, 总氮利用率达到81.5%, 对稻秆的降解率也高于干猪粪, 稻秆的总质量损失率达到48.3%, 纤维素、半纤维素和木质素的降解率分别达到67.3%、79.3%和27.9%。在稻秆的生物预处理中, 无论采用哪种氮源方式, 反应系统的pH值都在6.5~8.2之间变化, 不会产生酸化现象。以新鲜猪粪代替蛋白胨作为稻秆生物预处理的氮源, 既降低了稻秆生物预处理的运行成本, 又消除了猪粪造成的环境污染, 这对沼气的工业化生产具有重要的应用价值。

英文摘要:

In order to improve the acidification efficiency of rice straw in biogas production, provide cheap nitrogen source for the growth of high-temperature composite strains WSC-6, and reduce operating costs, biological pretreatment of rice straw was carried out by high-temperature composite strains WSC-6 and using untreated rice straw as carbon source and fresh swine manure or dried swine manure as nitrogen source. The result indicated that nitrogen source in fresh swine manure could be sufficiently utilized by high-temperature composite strains WSC-6, and the utilization rate of total nitrogen reached to 81.5%. The degradation rate of rice straw in fresh swine manure was also higher than that in dried swine manure, and total degradation rate of rice straw in fresh swine manure was 48.3%, and degradation rate of cellulose, hemicellulose and lignin was 67.3%、79.3% and 27.9%, respectively. In biological pretreatment process of rice straw, whether fresh swine manure or dried swine manure as nitrogen source, the reaction would not produce acidification with pH values ranging from 6.5 to 8.2. Fresh swine manure as nitrogen source both reduced biological pretreatment costs of rice straw, and eliminated the environmental pollution, which is important to improve the biogas industrialization production.

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