

玉米秸中温与常温厌氧生物气化的比较研究

Anaerobic digestion of corn stalk for biogas production: ambient vs. mesophilic temperature

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中文摘要:

为解决玉米秸的资源化利用问题, 提出通过厌氧消化的方法将其转化成生物气体。比较了在中温和常温条件下, 不同负荷率(35、50、65 g/L)对玉米秸秆日产气量、累积产气量、总干物质(TS)和挥发性有机物(VS)消化率的影响。试验结果显示, 不论是在中温还是在常温条件下, 50 g/L TS负荷率都获得了较高的累积产气量; 相对于常温而言, 中温厌氧消化的累积产气量提高了63%, 总干物质(TS)和有机物(VS)消化率分别增加33%和49%, 产气速率也明显提高。因此, 使用50 g TS/L负荷率, 在中温条件下对玉米秸秆进行厌氧消化是比较好的。该试验结果可为玉米秸秆的大规模生物气化提供重要设计依据。

英文摘要:

Anaerobic digestion technology for corn stalk conversion to biogas was investigated for corn stalk utilization and pollution reduction. Two temperatures(ambient and thermophilic) and three loading rates of 35, 50, 65 g/L were tested, and their effects on biogas production, total solid(TS) and volatile solid(VS) reduction were compared. The results showed that the loading rate of 50 g/L achieved highest cumulative biogas production for both temperatures. The temperature is one of major factors affecting efficiency and rate of anaerobic digestion of corn stalk. As compared with ambient temperature, mesophilic digestion with the loading rate of 50 g/L was able to achieve 63% higher cumulative biogas production, 33% and 49% more reduction of TS and VS and need 10 days less hydraulic retention time. Therefore, it had favorable economy and is recommended. This study could provide useful parameters for the design of large-scale anaerobic digester for corn stalk conversion for biogas production.

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