

农产品辐照研究 · 食品科学

γ射线辐照与NaOH溶液协同预处理对玉米秸秆酶解产糖率及微观结构的影响

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摘要:

为提高玉米秸秆的酶解产糖量,研究γ射线辐照与NaOH溶液协同处理对玉米秸秆中酶解还原糖得率的影响。采用红外光谱(IR)、X射线衍射分析和扫描电镜(SEM)分析协同处理对玉米秸秆微观结构的影响。结果表明,较低剂量辐照对玉米秸秆酶解还原糖得率作用不明显,但可大幅降低后续碱浸泡所需的用量和时间。电镜扫描结果表明,经200kGy剂量辐照与碱协同预处理的样品,表面积增加最多。经200kGy辐照和2% NaOH溶液协同预处理的玉米秸秆,其酶解还原糖含量达到了48.34%,这为应用酶解玉米秸秆生产工业乙醇提供了理论依据。

关键词: 玉米秸秆 γ射线辐射 NaOH溶液 预处理 酶水解

EFFECT OF γ-RAYS IRRADIATION AND ALKALI SOLUTION PRETREATMENT ON HYDROLYZING ENZYME AND MICROCOSMIC STRUCTURE OF CORN STRAW

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Abstract:

To increase yield of reducing sugar enzymatic hydrolyzed from corn straw yield of corn stalk on Enzymatic hydrolysis,γ-rays radiation and NaOH solution pretreatment were used.The changes of microstructure of the corn straw before and after pretreatments were characterized by IR, X-rays diffraction and SEM. The result shows that the γ-rays radiation can significantly decrease the essential concentration of NaOH solution and shorten the immersion time, but it could not affected the yield of reducing sugar remarkably. The scanning electron microscopy (SEM) results show that the sample which was treated at the 200 kGy irradiation dose and NaOH solution circumstance has the biggest surface area increase. The reducing sugar content of enzyme hydrolyzed corn straw treated at 200 kGy irradiation dose and 2% NaOH solution was achieved 48.34%, which provides the theoretical basis for industry ethanol production using enzyme hydrolyzed corn straw.

Keywords: corn straw γ-rays irradiation NaOH solution pretreatment enzyme hydrolysis

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