

Development of using Non-edible

Biomass to prepare ethanol fuel

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Abstract:

biomassenergy

CleanandrenewableEnergy.At present,usingnon-edibleBiomassasrawmaterialtopreparerenewableethanolfuelhasbeenconc
ernedbyagrowingnumber toresearchers.ThisarticlefocusedOn thePreparationof ofethanol
fuelfromcellulosicBiomassthenDevelopmentaKeytechnology,pointedoutitsBroaddevelopmentProspects.

Keywords: Development ; using Non-edible;Biomass to prepare

1. development of fuel ethanol at home and abroad

fuel ethanol is added as fuel to gasoline,in dieseethanol,partially replace oil,Mitigation of oil shortages^[4].fuelEthanol as a new energy,not only clean,renewable,theand the netgreenhouseeffect Low.World First1Fuel ethanol item--Pro alcoholto1975year born in Brazil;Next in1978Year AmericacountryCanadaalso launched similar projects.currently in the projectMore active countries are the United States and Brazil^[5],this2National Ethanoloutput for global ethanol totaloutput70%above^[6].Brazil about40%car full ethanol fuel,????year the country'sethanol output1\$millionT,Oil substitution rate is closeto40%.2006year,Brazil production fuel ethanol175billionDM³,Exportbillion,97%ethanol as fuel use^[7].Fuel Ethanol Scheduletheimplementation of the has brought significant benefits to Brazil^[8].as countries increaseEthanol gasoline application intensity,drives world production of fuel ethanolyearly Climb.recent years,due to rising oil prices,Fuel B

Alcohol consumption growth is also accelerating^[9].

is currently,China's biofuel ethanol production technology has made great stridesProgress,ecust from85""nonporous agricultureForest discards production fuel ethanol technology,successively assume national85","95","15"[Science and technology projects] and"863"Schedule Items,meshPre completedt/aacid hydrolysis fiber ethanol production pilot testappliance,and approved by science department^[10].2006year,Shandong zethe biotechCompany announces that they pioneered straw pollution-free blasting.operation,and a breakthrough in the fermentation of solid strains,Isabout to build3T/aThe Cellulose Ethanol demonstration project of^[one].China bio-fire materialalready hasthe industrial conditions,Heilongjiang,Jilin,Liaoning,RiverSouth,Anhui5Province and Hubei,Hebei,Shandong,parts of Jiangsu provincehas basically implemented automotive ethanol gasoline instead of ordinary unleaded petrol^[11].2006year,production of Chinese fuel ethanol reached144millionT,Tobecome the WorldWorld third largest fuel ethanol producer^[12].The future of fuel ethanol is very goodBroad.

2. sources of fuel ethanol production

The production of fuel ethanol has sugars,starch and cellulose,itsYield Limited by food resources,cost high,difficult to meet energy needsseek.from national conditions,Food for fuel ethanolLimited,so you have to look for rich and inexpensive sources of raw materials,Last a fewYear This research focuses on cellulose^[6].

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Cellulose Biomass is the most widely produced source in the world. Fuel Ethanol biomass raw materials, Main organic of cellulose waste ingredients include hemicellulose, cellulose and lignin. Containing wood. The biomass waste of cellulose includes crop stalks, Forestry plus work Scrap, waste material contained in sugarcane residue and municipal waste etc. China is a big agricultural country, on the one hand produces a lot of biomass every year, quality waste not fully exploited, and often burned in place, dyed environment; On the other hand, Fossil Resources are limited, cannot meet growing long fuel requirements. So developing non-food biomass in China. Fuel Ethanol technology makes more sense^[a]. Estimated by relevant experts, China. The amount of biomass resources that can be developed is approximately 7 billion Tce^[a].

3. Fuel Ethanol production technology

production process of fuel ethanol from cellulosic biomass raw materials mainly include preprocessing, hydrolysis and fermentation stages.

3.1 preprocessing process

The primary purpose of the preprocessing is to destroy lignin and half fiber to reduce the crystallinity of cellulose, increase its porosity^[a], so to make enzyme preparations fully in contact with cellulose, Complete enzymatic reaction. The primary pretreatment method for the cellulose material used by the IS physical Method, Chemical Method, physicochemical Bonding, Biological Method^[?].

3.2 hydrolysis Process

The process of producing ethanol from cellulose biomass as raw material mainly strong acid hydrolysis, Dilute acid hydrolysis and enzymatic hydrolysis^[1], They have no same mechanism.

3.2.1 acid hydrolysis

The principle of acid hydrolysis is the crystallization of cellulose at lower temperatures can be completely dissolved in sulfuric acid, convert low to contain several glucose cells candy^[2]. Add water to dilute this solution and heat the, after a certain time to hydrolyze oligosaccharides to glucose. The advantage of acid hydrolysis is that the sugar Recovery high (upto 90% above), can handle different original material, relatively fast (total Ten~h) and rarely degrade, But the device request High, and acid must be recycled.

3.2.2 Dilute acid hydrolysis

Dilute acid hydrolysis mechanism is the solution of hydrogen ions can and cellulose binding of oxygen atoms on, make it unstable, easy and water anti-to, fiber long chain is broken at that point, The also emits hydrogen ions, To achieve continuous coalescence of cellulose long chains, until decomposed into the most small cell glucose. Dilute acid hydrolysis raw material processing time short, and more Easy to implement industrialization, But the resulting sugar will decompose further, The affects the sugar yield^[1].

3.2.3 enzymatic hydrolysis

enzymatic hydrolysis is a biochemical reaction, It has a number of advantages. It's at ambient temperature under, microbial cultivation and maintenance only need less raw materials, over To Low energy consumption. Enzymes have high selectivity, generate a single product, so sugar yields are high (greater than 95%).

3.3 fermentation process

The fermentation process for glucose is already very mature., But wood fiber. The fermentation of alcohol in the process of ethanol processing is very different from the fermentation of starch or sugar to the original, This mainly in the following 2 Point: one is a group of biomass hydrolysate which often contains harmful effects on fermented microorganisms. Sub; Second, the hydrolysis of sugar contains more xylose.

4. Epilogue

fuel ethanol is a huge renewable energy, Development includes Fuel Ethanol the bio-energy industry is the solution

to the shortage of oil, ring border pollution problems and promoting agricultural development, accelerating socialist new countryside One of the important strategic initiatives of construction. with cellulose biomass as the original material for fuel ethanol, cheaper, Although this raw material is used to give birth to Experimental route for ethanol production has been developed, but currently implementing materialized production, on raw material pretreatment, hydrolysis, fermentation process There are also technical issues with the, Causes high production cost and hard mass production^[1-10]. developing fuel ethanol in China also faces on raw material, multiple issues with energy consumption and production costs. However, with the depletion of fossil resources, Development of fuel ethanol may become a main direction for. Implementing non-edible biomass resources Development and utilization will improve China's ecological environment, Create a sustainable energy system, promoting economic and social development with significant effect^[2-10].

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