



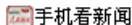
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Case Study

生物质高值化 (Biomass High-Value)

农林剩余物可望成化石燃料替代物

2014年02月20日01:18 来源：科技日报 

打印 网摘 纠错 商城 分享 推荐   字号  

原标题：农林剩余物可望成化石燃料替代物

科技日报讯（王建兰 胡利娟）将木屑、枝桠、秸秆等农林剩余物高值化综合利用替代化石燃料的科技梦想将有望实现。

近日，从中国林业科学研究院林产化学工业研究所（以下简称林化所）获悉，由该所所长蒋剑春研究员率领的创新团队，经过10多年的苦心研究，创新集成的“农林剩余物多途径热解气化联产炭材料关键技术”，已成功实现了生物质气化发电、供热、供气的产业化应用。该成果具有自主知识产权，并获得了2013年度国家科技进步二等奖。

蒋剑春介绍说，所谓的生物质多途径热解气化，就是利用内循环锥形流化床、上吸式气化炉、下吸式气化炉三种不同设备和工艺路线，采用最低成本的空气气化法，将农林剩余物完全气化或部分气化制备燃气，并且生产出的高附加值炭材料还可应用于工业。

据了解，目前，运用该技术成果已成功建成世界上最大规模的、利用生物质燃气供热的、年产5000吨的化学法活性炭示范生产线。现在北京、安徽、山东、辽宁等地推广应用，并出口英国、意大利、日本、马来西亚等10多个国家。



生物质(秸秆、木屑等)高值化的研究现状?

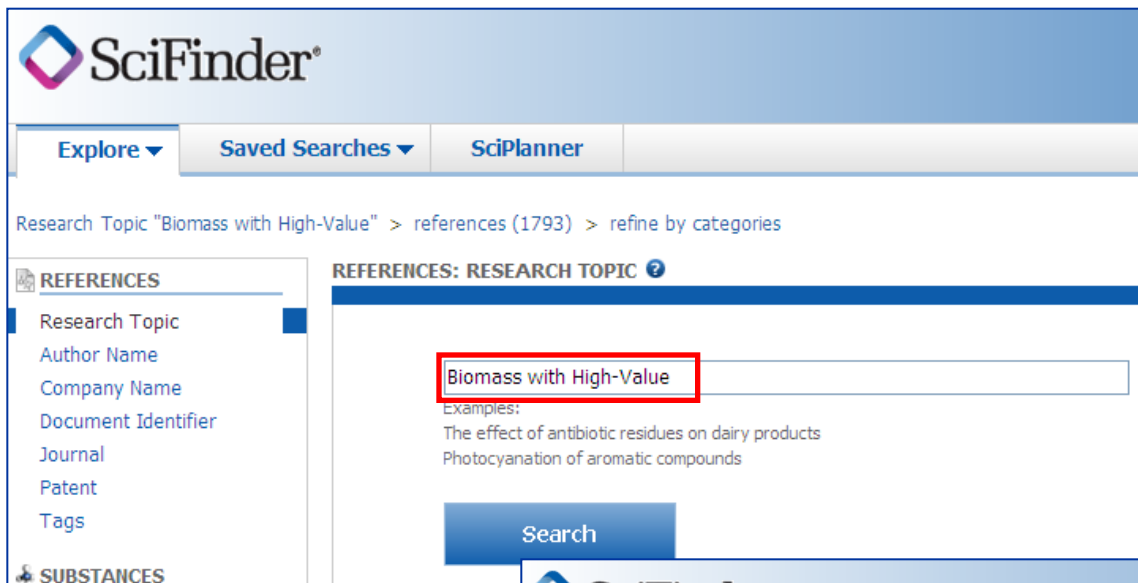
生物质高值化有哪些方法?

生物质高值化的应用?

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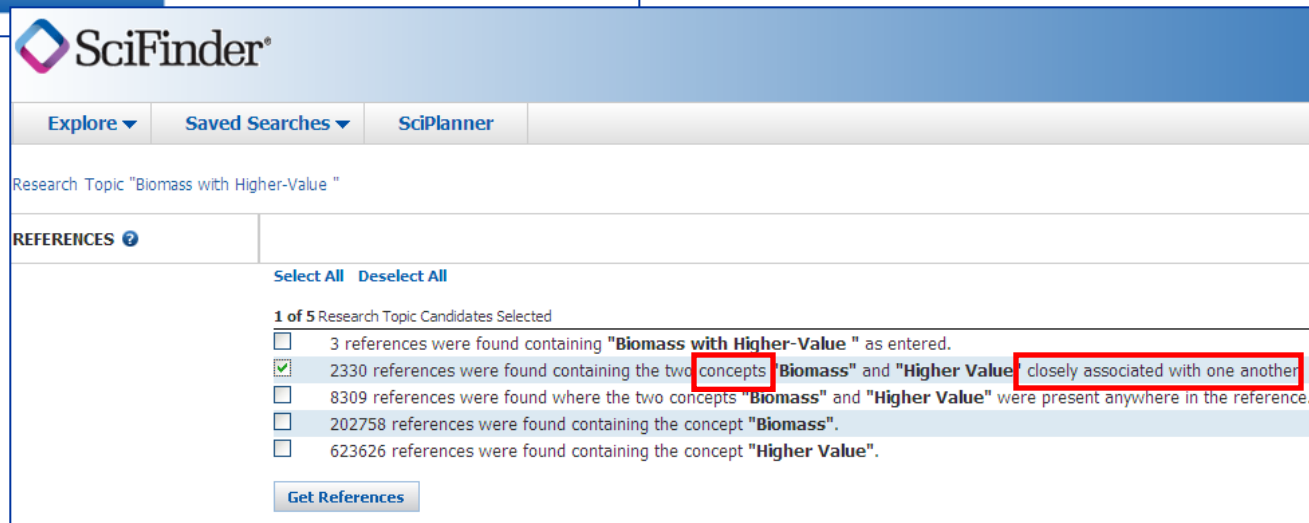
Biomass with High-Value

Examples:
 The effect of antibiotic residues on dairy products
 Photocyanation of aromatic compounds

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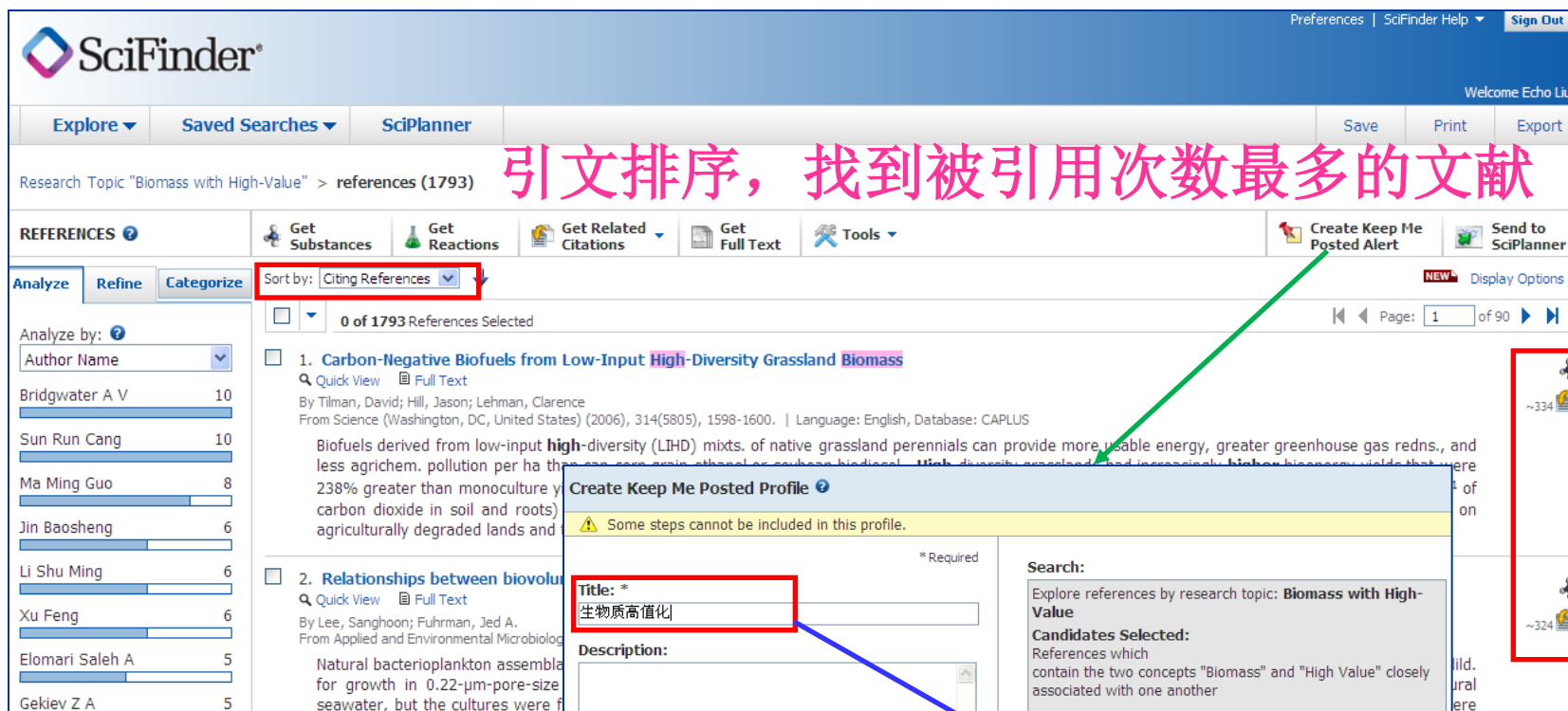
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- 202758 references were found containing the concept "Biomass".
- 623626 references were found containing the concept "Higher Value".

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Research Topic "Biomass with High-Value" > references (1793)

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0 of 1793 References Selected

1. Carbon-Negative Biofuels from Low-Input High-Diversity Grassland Biomass
 By Tilman, David; Hill, Jason; Lehman, Clarence
 From Science (Washington, DC, United States) (2006), 314(5805), 1598-1600. | Language: English, Database: CAPLUS
 Biofuels derived from low-input high-diversity (LIHD) mixts. of native grassland perennials can provide more usable energy, greater greenhouse gas redns., and less agrichem. pollution per ha than can corn, sorghum, ethanol or soybean biodiesel. High diversity grassland had increasingly higher bioenergy yields that were 238% greater than monoculture y carbon dioxide in soil and roots) agriculturally degraded lands and

2. Relationships between biovolu
 By Lee, Sanghoon; Fuhrman, Jed A.
 From Applied and Environmental Microbiolog
 Natural bacterioplankton assembl for growth in 0.22-µm-pore-size seawater, but the cultures were f

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 生物质高值化

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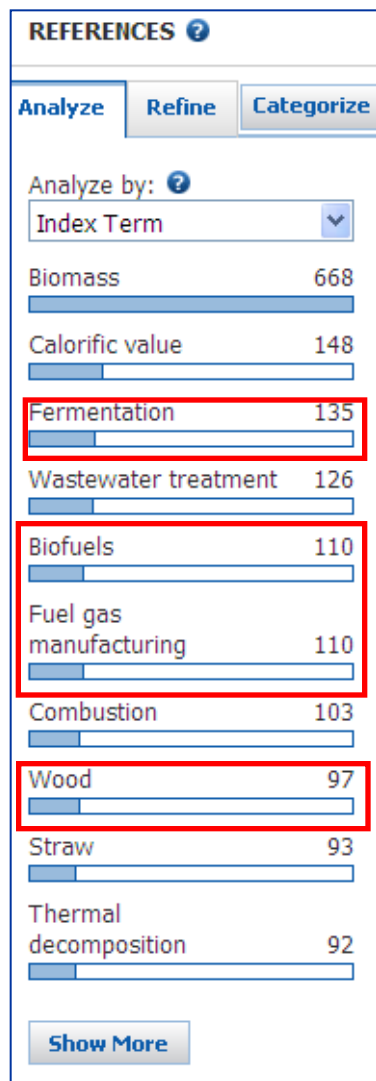
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生物燃料

燃气生产

木材



电化学、热能技术

发酵和生物工业化学

废物处理

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- Publication Year
- Language
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Document Type(s)

- Biography
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- Commentary
- Conference
- Dissertation
- Editorial
- Historical
- Journal
- Letter
- Patent
- Preprint
- Report
- Review

Refine

1. **Energy conversion of biomass with supercritical and subcritical water using large-scale plants**
 Quick View Full Text
 By Okajima, Idzumi; Sako, Takeshi
 From Journal of Energy Conversion (2014), 33, 1-10. | Language: English, Database: CAPLUS

Exploiting the advantages of supercritical and subcritical water, this review focuses on the cost in converting biomass to use liquid, gas, or solid fuels that have high-calorific values, low moisture and ash contents, uniform composition, and suitable for stored over long periods. In biomass treatment, hot and high-pressure water including supercritical and subcritical water is an excellent solvent, as it is clean and safe and its action on biomass can be optimized by varying the temperature and pressure. In this article, the conversion of waste biomass to fuel using hot and high-pressure water is reviewed, and the following examples are presented: the production of large amounts of hydrogen from waste biomass, the production of cheap bioethanol from non-food raw materials, and the production of composite powder fuel from refractory waste biomass in the rubble from the Great East Japan Earthquake. Several promising techniques for the conversion of biomass have been demonstrated in large-scale plants and commercial deployment is expected in the near future.

利用大型设备在超临界和亚临界水条件下的生物质能量转换

2. **Lignin in straw and its applications as an adhesive**
 Quick View Full Text
 By Ghaffar, Seyed Hamidreza; Fan, Mizi
 From International Journal of Adhesion and Adhesives (2014), 48, 92-101. | Language: English, Database: CAPLUS

A review of the relevant information about the lignin in straw and its applications in the industry is scattered and scarce compared to the wood lignin. This review is focused on the lignin in straw and its applications as an adhesive. The review has shown that (1) lignin as a byproduct of straw has a great potential for many applications across various industries, including traditional products, e.g. resins, and composites, and emerging materials, e.g. biofuel and commodity chemicals. (2) The type of lignin differs not only from one to another species but also depending on the isolation protocol. However, the lack of optimizing or processing technologies is significant when it comes to using technical lignin. The review has also shown a great encouragement in studying the lignin within the straw and other herbaceous crops, and the creation of the functionalities of lignin as it does with cellulose and hemicellulose could lead to radical development of lignin as bio-matrix for green composites and biomass as biofuel or other high value added applications.

稻草中的木质素和它作为粘胶剂的应用

3. **Production and modification of nanofibrillated cellulose using various mechanical processes: A review**
 Quick View Full Text
 By Abdul Khaliq, H. P. S.; Davoudpour, Y.; Islam, Md. Nazrul; Mustapha, Asniza; Sudesh, K.; Dungani, Rudi; Jawaid, M.
 From Carbohydrate Polymers (2014), 99, 649-665. | Language: English, Database: CAPLUS

国内有哪些机构从事生物物质高值化研究呢？

竞争对手or合作伙伴

REFERENCES ?

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Company Name

Examples:

3M

DuPont

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Chinese academy of Sciences, Peop Rep China	35
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South China University of Technology, Peop Rep China	10
Zhejiang University, Peop Rep China	10
Southeast University, Peop Rep China	9
Ocean University of China, Peop Rep China	7
University of Science and Technology of China, Peop Rep China	7

根据研究机构对文献进行分类



限定研究机构为“China”

生物质高值化的工艺研究？

Categorize ⓘ

1. Select a heading and category. 2. Select index terms of interest.

Category Heading	Category	Index Terms	Selected Terms
All	Materials & products (281)	Page: 1 of 3 Select All Deselect All <input type="checkbox"/> Fermentation 133 <input checked="" type="checkbox"/> Fuel gas manufacturing 107 <input type="checkbox"/> Combustion 103 <input type="checkbox"/> Simulation and Modeling 74 <input type="checkbox"/> Gas generators 45 <input type="checkbox"/> Bioreactors 43 <input type="checkbox"/> Fuel gas manufacturing apparatus 42 <input type="checkbox"/> Reactors 29 <input type="checkbox"/> Fluidized beds 23 <input type="checkbox"/> Extraction 21 <input type="checkbox"/> Recycling 21 <input type="checkbox"/> Boilers 20 <input type="checkbox"/> Drying process 20 <input type="checkbox"/> Adsorption 19 <input type="checkbox"/> Heating 18	Click 'x' to remove the category from 'Selected Terms' * Technology > Processes & apparatus (1 Terms) 发酵 燃气生产 生物反应 流化床
General chemistry	Formed, removed, & other substances (555)		
Genetics & protein chemistry	Substances in technology (687)		
Physical chemistry	Processes & apparatus (282)		
Polymer chemistry	Metallurgy (139)		
Technology	Power & fuel topics (67)		
Biology	Construction (22)		
Environmental chemistry	Ceramics (5)		
Synthetic chemistry	Imaging & recording (4)		
Biotechnology			
Catalysis			
Analytical chemistry			

Technology > Processes & apparatus > 1 Index Term(s) Selected

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生物质高值化燃气生产方面的文献

8. Semi-continuous biomass gasification with water under sub critical conditions

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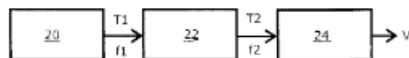
By Molino, A.; Migliori, M.; Nanna, F.; Tarquini, P.; Braccio, G.
 From Fuel (2013), 112, 249-253. | Language: English, Database: CAPLUS

The paper reports on gasification of almond shells with water at **high** pressure (above crit. **value**) and temp. The exptl. set up was a semi-continuous reactor, an innovative configuration allowing to co-gasify biomass with water at **value** (30 MPa) and relatively low temp. (**critical conditions**) leading to a liq. phase rich of some interesting compds. (HMF, furfural). **临界条件下的半连续式生物质气化** According to an already proposed reaction scheme, results confirmed a pos. impact of the addnl. compd. to the liq. yield and quality, while the gaseous phase was enriched in carbon dioxide.

9. Fine purification of product gases generated by the thermochemical conversion of biomass

Quick View Full Text

By Athmann, Uwe; Tuxhorn, Joerg; Hofer, Lothar; Boye, Jan
 From Ger. Offen. (2013), DE 102011122158 A1 20130627. | Language: German, Database: CAPLUS



A process for the purifn. of a product gas produced by thermochem. conversion of **biomass** and having a calorific **value** suitable for further energy conversion includes the following process stages: thermochem. conversion of **biomass** in a reactor; discharging the produced product gas contg. contaminants, esp. dust particles and tar aerosols, from the reactor; supplying the product gas to a filter device in the form of a fibrous deep bed filter consisting of ≥ 1.5 kg of fibers/m² of inflow surface being operated in a wet condition; and providing the purified product gas to a consumer. The **high**-performance gas scrubber can be a one- or multi-stage rotational scrubber, Venturi scrubber, disintegrator scrubber, Bayer-Reiter scrubber, or other wet scrubbers. The filter is wetted with a liq., preferably with steam. The filter uses glass wool, rock wool, aluminosilicate fibers, sheep wool, felts, hemp, flax, or coconut fibers as fibrous filter material. The filter material is packed into cartridges for a simple replacement of the filter material.

由生物质热化学转化生成的气体产物的提纯精制

10. Prediction of quality parameters of biomass pellets from proximate and ultimate analysis

Quick View Full Text

By Gillespie, Gary D.; Everard, Colm D.; Fagan, Colette C.; McDonnell, Kevin P.
 From Fuel (2013), 111, 771-777. | Language: English, Database: CAPLUS

The real-time prediction of crucial **biomass** pellet quality parameters such as **higher** heating **value** (HHV) and mech. durability (MD) will allow for more efficient

生物质高值化有哪些方面的应用？

REFERENCES ?

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- Author
- Company Name
- Document Type
- Publication Year
- Language
- Database

Research Topic

Examples:

The effect of antibiotic residues on dairy products

Photocyanation of aromatic compounds

Refine

进一步限定研究主题为“application”

4. Co-ordination network for lignin-standardisation, production and applications adapted to market requirements (EUROLIGNIN)

Quick View Full Text

By Gosselink, R. J. A.; de Jong, E.; Guran, B.; Abacherli, A.
 From Industrial Crops and Products (2004), 20(2), 121-129. | Language: English, Database: CAPLUS

Lignin is one of the most abundant renewable raw materials available on earth. Despite its unique characteristics as a natural product with multiple chem. and

协调木质素的标准化、生产和应用以适应市场的需要

from leftovers in pulp and paper, and biomass processes to industry and consumers. This will be accomplished by compilation of fundamental information packages on existing and future lignin prodn. and utilization to create defined actions in research projects and technol. activities that very precisely and with direct economic implications show the way to increased use of lignin. EUROLIGNIN consists of 26 participants including lignin producers, research centers, universities and lignin end users from 16 European countries resulting in a well-balanced consortium.

5. Contemporary issues in thermal gasification of biomass and its application to electricity and fuel production

Quick View Full Text

By Wang, Lijun; Weller, Curtis L.; Jones, David D.; Hanna, Milford A.
 From Biomass and Bioenergy (2008), 32(7), 573-581. | Language: English, Database: CAPLUS

生物质热气化及其应用在电力和燃料生产方面的现实问题

gasification and syngas utilization. This review was conducted to introduce the recent advances in biomass gasification and syngas utilization. The crit. tech. issues and perspectives of biomass gasification were discussed.

6. Bamboo: an overlooked biomass resource?

Quick View Full Text

By Scurlock, J. M. O.; Davton, D. C.; Hames, B.
 From

竹子，一种被忽略的生物质资源

om 10 cm to 40 m in height. Already in everyday use
 nergy or fiber crop for niche markets, although some

2014年英国布鲁内尔大学工程与设计学院发表的一篇关于木质素应用的研究文献

COMPANY/ORGANIZATION

Nanocellulose and
 Biocomposites Research
 Centre, School of
 Engineering and Design
 Brunel University
 Middlesex, UK UB8 3PH

1. Lignin in straw and its applications as an adhesive

By: Ghaffar, Seyed Hamidreza; Fan, Mizi

A review. The relevant information about the lignin in straw and its applications in the industry is scattered and scarce compared to the wood lignin. This review is focused on the chem. structural and compn. of lignin in the straw, and its modification and uses as an adhesive. The review has showed that (1) lignin as a byproduct in the pulping process and as an abundant natural and renewable product has been used and there is a great potential for many applications across various industrial sectors as a replacement for increasingly scarce and expensive petroleum based materials, including traditional products, e.g. resins, and composites, and emerging materials, e.g. biofuel and commodity chems. (2) The type of lignin differs not only from one to another species but also depending on the isolation protocol. However, the lack of optimizing or processing technologies is significant when it comes to using tech. lignin. The review has also shown a great encouragement in studying the lignin within the straw and other herbaceous crops, and the creation of the functionalities of lignin as it does with cellulose and hemicellulose could lead to radical development of lignin as bio-matrix for green composites and biomass as biofuel or other high value added applications.

- 1、本研究对稻草中的木质素和木材中的木质素在工业中的应用作了比较
- 2、木质素是制浆过程的副产物，被认为是一种丰富的自然资源和可再生能源。
- 3、木质素在各个工业部门中作为替代日益稀缺和昂贵的石油为基础的材料具有巨大的潜力。
- 4、木质素可作为生物基绿色复合材料或生物燃料及其他高附加值应用。



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