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Case Study

生物质高值化（Biomass High-Value）

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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　手机看新闻

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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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SciFinder文献检索

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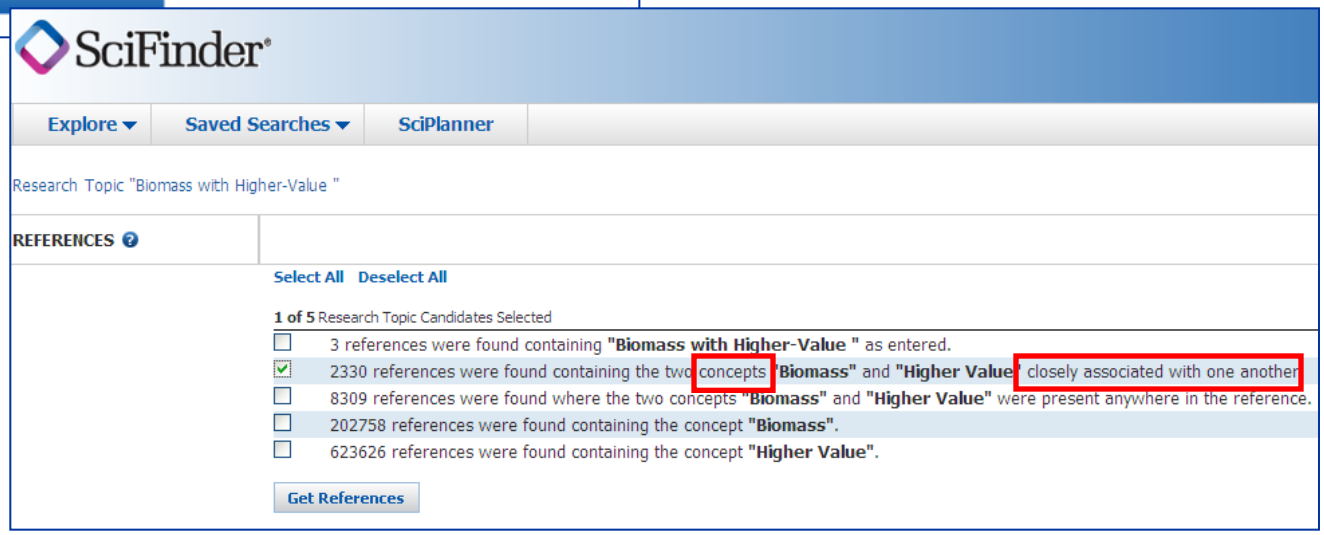
Biomass With High-Value

选择同时包含“Concepts”和“closely associated with one another”的候选结果



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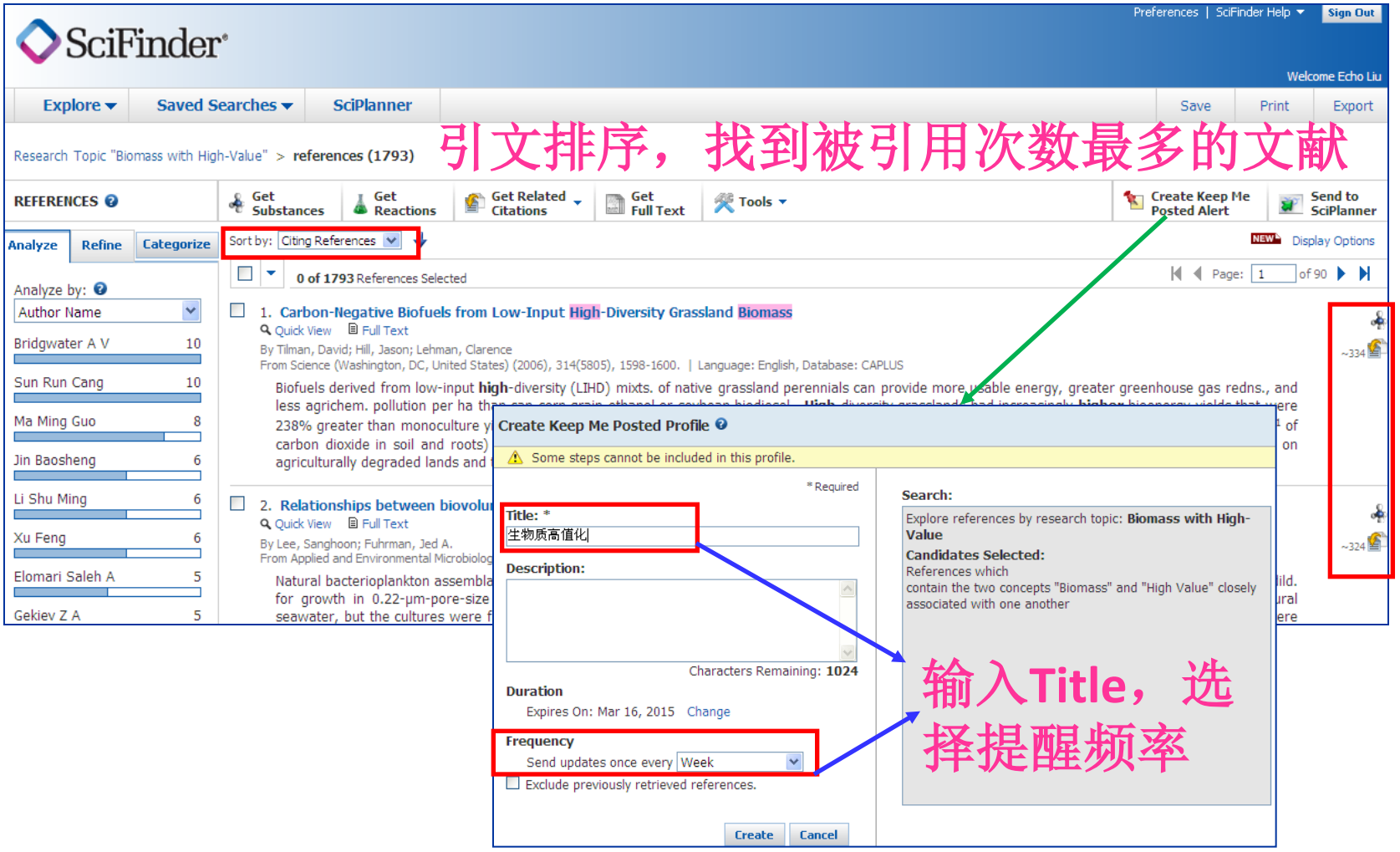
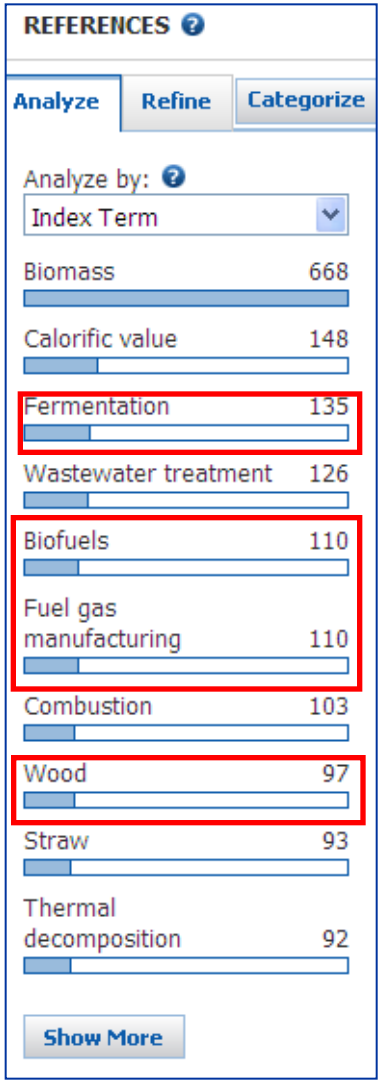
获得生物质高值化的文献



生物质高值化的研究内容和学科？

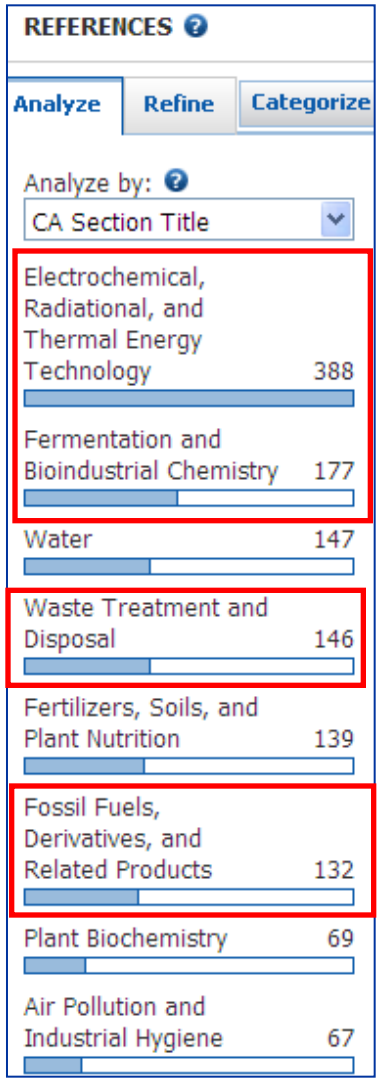


发酵

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

化石燃料，衍生物和相关产物

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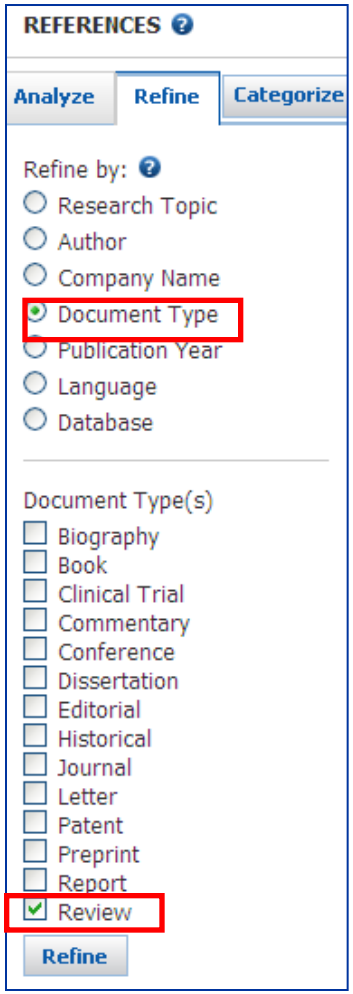
通过综述文献快速了解研究概况



限定文献类型为“Review”，快速查找综述

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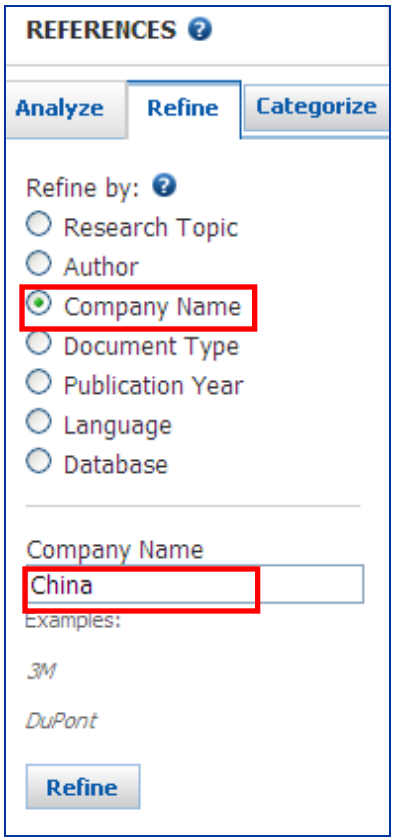
国内有哪些机构从事生物质高值化研究呢？

竞争对手or合作伙伴



根据研究机构对文献进行分类

限定研究机构为“China”

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北京林业大学的研究文献

0 of 13 References Selected

1. **Structure and antioxidant activities of alkaline lignins from steam exploded bamboo chips**

Quick View | Full Text

By Sun, Shaoni; Cao, Xuefei; Xu, Feng

From Abstracts of Papers, 247th ACS National Meeting & Exposition, Dallas, TX, United States, March 16-20, 2014 (2014), CELL-122. | Language: English, Database: CAPLUS

An environmental-friendly steam explosion process of bamboo chips followed with alkali and alk. ethanol post treatment (EP-A/AE process) was developed to produce bioethanol efficiently. This biorefine

蒸汽分解的竹片中碱性木质素的结构和抗氧化活性

of series study, the chem. and structural fea
spectroscopies, as well as antioxidant activity anal. It was found that the lignins contained low contents of carbohydrates (0.55-1.76%), and showed low mol. wts. (780-1050 g/mol) together with narrow polydispersities (M_w/M_n, 1.48-1.84). This suggested that EP-A/AE process produced relatively pure and **high**-quality lignins which are suitable for further applications. For each steam-exploded sample, as compared to alk. ethanol-extd. lignins, alkali-extd. lignins presented **higher** phenolic-OH, carboxylic-OH, pCA/FA ratios, and S/G ratios. HSQC NMR spectra revealed that bamboo lignin mainly consisted of β-O-4' combined with small amts. of β-β', β-5', and α, β-diaryl ethers linkages. Antioxidant activity investigation indicated that the radical scavenging index (RSI) of fractionated lignins (5.00-8.33) was much **higher** than that of BHT (0.22) but lower than that of BHA (12.5), suggesting that the biorefinery process is a promising method to fractionate lignin with good antioxidant activity for potential application in food industry.

2. **Environmentally-friendly sonochemistry synthesis of hybrids from lignocelluloses and silver**

Quick View | Full Text

By Dong, Yan-Yan; Li, Shu-Ming; Ma, Ming-Guo; Zhao, Jin-Jin; Sun, Run-Cang; Wang, Shan-Peng

From Carbohydrate Polymers (2014), 102, 445-452. | Language: English, Database: CAPLUS

The purpose of this study was to explore a green strategy about the **high value**-added applications of **biomass**. Hybrids from lignocelluloses and silver have been successfully prepd. using $NaBH_4$ as redu
e, and morphol. of the hybrids were characterized by X-ray powder d

木质纤维素和银的环保声化学合成物

us reaction parameters including reaction time, lignocelluloses concn.,
can be better dispersed on the lignocelluloses matrix by adjusting reaction parameters. These hybrids may be a promising antimicrobial material for their applications in the biomedical field. This environmentally-friendly synthetic strategy reported here opens a new window to the **high value**-added applications of lignocelluloses.

3. **Environmentally friendly ultrasound synthesis and antibacterial activity of cellulose/Ag/AgCl hybrids**

Quick View | Full Text

By Dong, Yan-Yan; Deng, Fu; Zhao, Jin-Jin; He, Jing; Ma, Ming-Guo; Xu, Feng; Sun, Run-Cang

From Carbohydrate Polymers (2014), 99, 166-172. | Language: English, Database: CAPLUS

This study aims to investigate the fabrication and property of cellulose/Ag/AgCl hybrids. In this article, prepn. of cellulose/Ag/AgCl hybrids was reported using the

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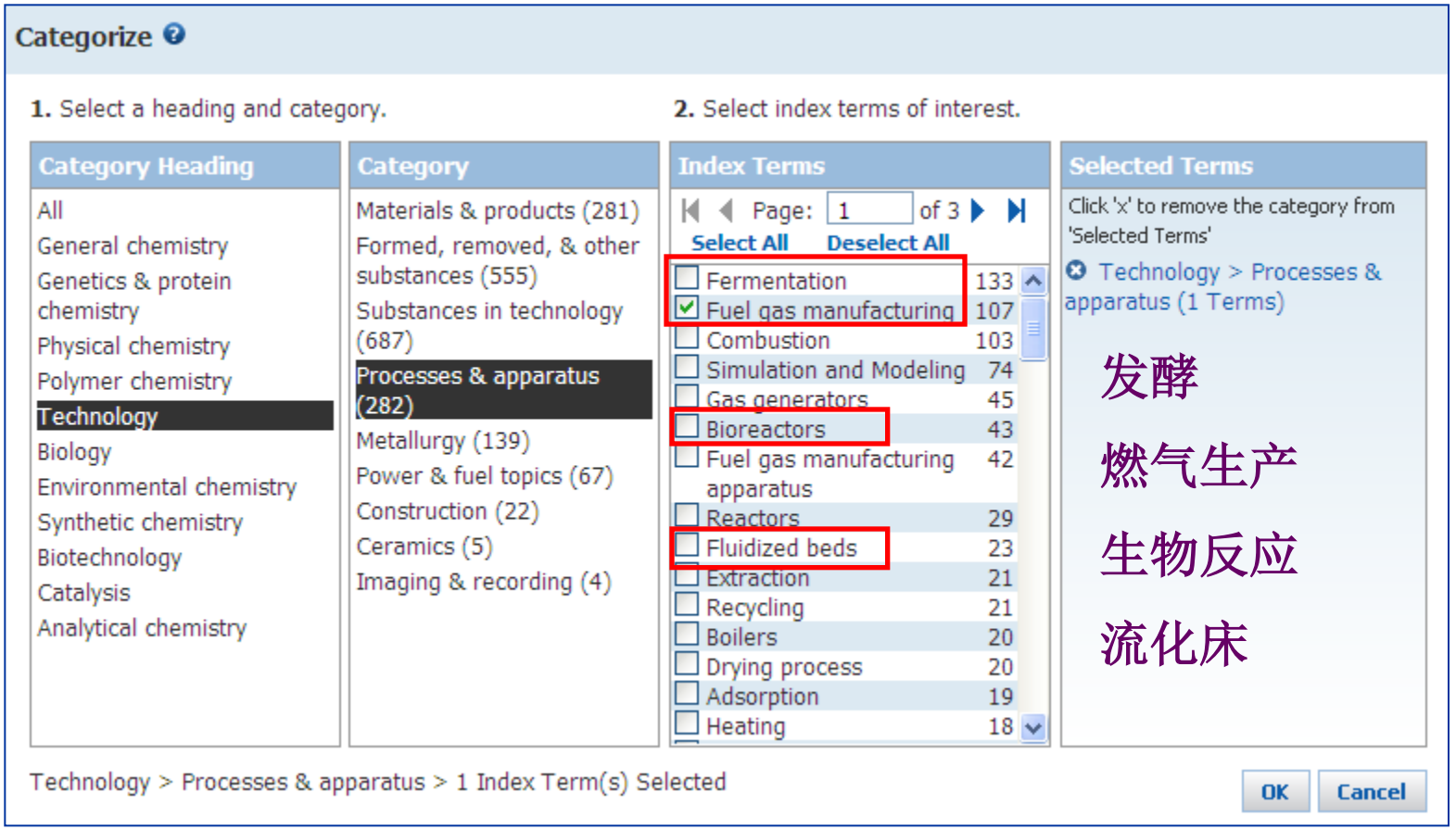
生物质高值化的工艺研究？



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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**

Quick View | Full Text

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

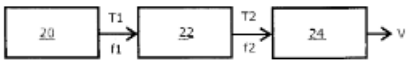
The paper reports on gasification of almond shells with water at **high** pressure (above crit. **value**) and temp. The exptl. set up was a semi-continuous reactor, an innovative configuration allowing to cor ns well above water crit. **value** (30 MPa) and relatively low temp. (ng to a liq. phase rich of some interesting compds. (HMF, furfural). he gasification reactions. 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.

临界条件下的半连续式生物质气化

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 p separator with pre-quenching means, or at having a diam. of about 1 μm, and in which t aerosols; and supplying the treated product gas contg. < 10% of the initial contaminant load to a filter device in the form of a fibrous deep bed filter consisting of ≥ 1.5 kg of fibers/m^2 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

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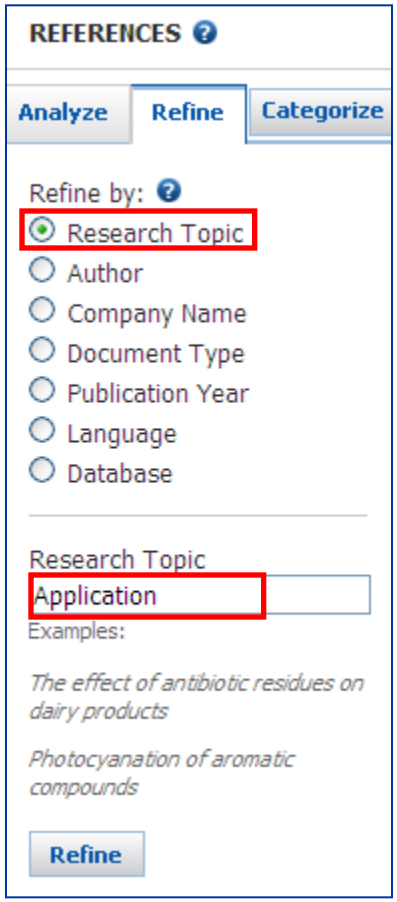
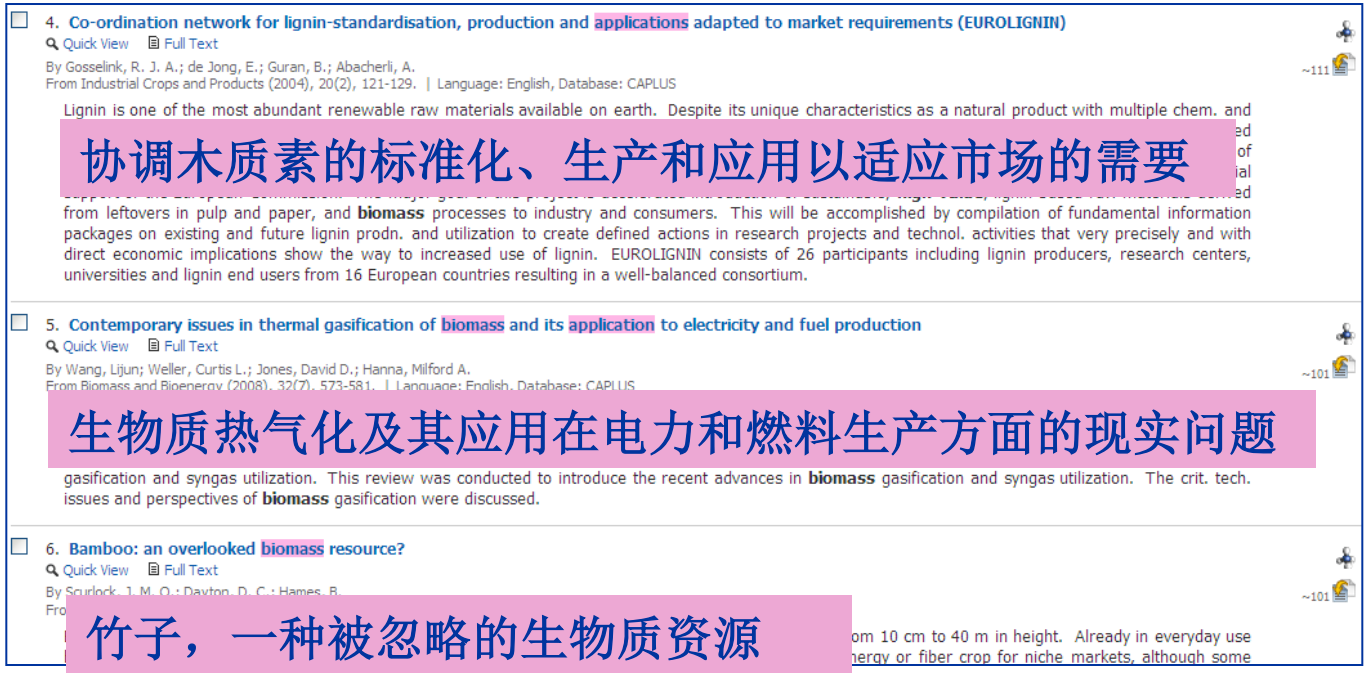
生物质高值化有哪些方面的应用？



进一步限定研究主题为“application”



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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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