显示 1 条，共 5 条

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标题: Pyrolysis Gas Chromatography Mass Spectrometry Studies to Evaluate High-Temperature Aqueous Pretreatment as a Way to Modify the Composition of Bio-Oil from Fast Pyrolysis of Wheat Straw

来源出版物: ENERGY & FUELS, 23: 6242-6252 DEC 2009

摘要: Hot water pretreatment was systematically studied to determine whether reaction selectivity of cellulose toward the production of anhydrosugars and furanics could be improved. Samples of wheat straw and alpha-cellulose were treated using hot compressed water at temperatures ranging between 150 and 260 degrees C. The effect of hot water pretreatment oil pyrolysis selectivity was measured using pyrolysis gas chromatography mass spectrometry (Py-GC/MS). Various representative peak area ratios were compared and used as all index of pyrolysis selectivity. The chemical and Py-GC/MS analysis of solid residues resulting from hot water pretreatment Suggest that. as the tempera tire increased, the hemicelluloses and amorphous cellulose were solubilized. The relative areas of the Py-GC/MS results associated with levoglucosan increased for both straw and alpha-cellulose with increasing treatment temperature. The results show that the selectivity of thermochemical reactions toward the production of sugars and furanics call be enhanced if the material is treated in hot water at temperatures between 220 and 260 degrees C, and file amount of acetic acid is reduced substantially. Thus, hot water pretreatment may be a viable method to modify the chemical composition of bio-oils produced via fast pyrolysis.

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显示 2 条，共 5 条

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标题: Energy conservation in drying of peeled longan by forced convection and hot air recirculation

来源出版物: BIOSYSTEMS ENGINEERING, 104 (2): 199-204 OCT 2009

摘要: Longan (Dimocarpus longan Lour.) is an economically important fruit crop in the north of Thailand. Despite its high energy consumption, hot air drying is still the most common method for the Thai agro-industry to process fresh longan. The aim of this study is to improve energy efficiency and reduce operating cost of current peeled longan drying process. This paper presents and evaluates methods for improvement of energy utilisation and reduction of energy cost per unit product mass in traditional longan fruit drying. A novel forced draft, recirculating air dryer was introduced. Performance in terms of specific energy utilisation, thermal efficiency and operating cost for both traditional and new designs was evaluated. Results showed that similar fresh to dried longan fruit ratio, colour and texture of dried products from traditional and new dryers were obtained. it was found that the new dryer yielded an average thermal efficiency of 29%, compared to 19% for the existing design. For the same mass of dried longan fruit produced, specific energy utilisation, fuel cost and operating cost were reduced by more than 42%, 45% and 27%, respectively. The improvement was attributed to enhanced heat transfer from free to forced convection, heat recovery via hot air recycling, better thermal insulation, and better temperature and humidity control. (C) 2009 IAgrE. Published by Elsevier Ltd. All rights reserved.

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显示 3 条，共 5 条

作者: Budarin, VL (Budarin, Vitaly L.); Clark, JH (Clark, James H.); Lanigan, BA (Lanigan, Brigid A.); Shuttleworth, P (Shuttleworth, Peter); Breeden, SW (Breeden, Simon W.); Wilson, AJ (Wilson, Ashley J.); Macquarrie, DJ (Macquarrie, Duncan J.); Milkowski, K (Milkowski, Kris); Jones, J (Jones, Jenny); Bridgeman, T (Bridgeman, Toby); Ross, A (Ross, Andy)

标题: The preparation of high-grade bio-oils through the controlled, low temperature microwave activation of wheat straw

来源出版物: BIORESOURCE TECHNOLOGY, 100 (23): 6064-6068 DEC 2009

摘要: The low temperature microwave activation of biomass has been investigated as a novel, energy efficient route to bio-oils. The properties of the bio-oil produced were considered in terms of fuel suitability. Water content, elemental composition and calorific value have all been found to be comparable to and in many cases better than conventional pyrolysis oils. Compositional analysis shows further differences with conventional pyrolysis oils

including simpler chemical mixtures, which have potential as fuel and chemical intermediates. The use of simple additives, e.g. HCl, H2SO4 and NH3, affects the process product distribution, along with changes in the chemical composition of the oils. Clearly the use of our low temperature technology gives significant advantages in terms of preparing a product that is much closer to that which is required for transport fuel applications.

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标题: MICROALGAE MASS PRODUCTION METHODS

来源出版物: TRANSACTIONS OF THE ASABE, 52 (4): 1275-1287 JUL-AUG 2009

摘要: This article reviews the performance, special features, and technical and/or economic barriers of various microalgae mass production methods including open-pond, photobioreactor, and immobilized culture systems. Open ponds are the least expensive among the three systems; however, issues of vulnerable species contamination, low productivity, high harvesting cost, and large volume of water loss have to be addressed. High biomass productivity and cell density, reduced contamination, and better use of CO2 are some advantages of photobioteactor systems, but the prohibitively high construction cost of photobioreactors still limits commercialization of such systems. Immobilized algae culture systems have great potential to obviate the harvesting problem of open ponds and photobioreactors and enhance biomass productivity; however, high material cost and limited choices of algae species require more investigation. Economics of algae biofuel manufacturing arc, also discussed. Algae biomass productivity, lipid content, and petroleum price are decisive factors in the economic viability of algae biofuels.

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显示 5 条，共 5 条

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标题: Life-Cycle Assessment of Biodiesel Production from Microalgae

来源出版物: ENVIRONMENTAL SCIENCE & TECHNOLOGY, 43 (17): 6475-6481 SEP 1 2009

摘要: This paper provides an analysis of the potential environmental impacts of biodiesel production from microalgae. High production yields of microalgae have called forth interest of economic and scientific actors but it is still unclear whether the production of biodiesel is environmentally interesting and which transformation steps need further adjustment and optimization. A comparative LCA study of a virtual facility has been undertaken to assess the energetic balance and the potential environmental impacts of the whole process chain, from the biomass production to the biodiesel combustion. Two different culture conditions, nominal fertilizing or nitrogen starvation, as well as two different extraction options, dry or wet extraction, have been tested. The best scenario has been compared to first generation biodiesel and oil diesel. The outcome confirms the potential of microalgae as an energy source but highlights the imperative necessity of decreasing the energy and fertilizer consumption. Therefore control of nitrogen stress during the culture and optimization of wet extraction seem to be valuable options. This study also emphasizes the potential of anaerobic digestion of oilcakes as a way to reduce external energy demand and to recycle a part of the mineral fertilizers.

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