Ethanol Production from Brewers’ Spent Grain Pretreated by Dilute Phosphoric Acid - DTU Orbit (07/10/2019)

Ethanol Production from Brewers’ Spent Grain Pretreated by Dilute Phosphoric Acid

This paper deals with the characterization of brewer’s spent grain (BSG) and the optimization of the phosphoric acid pretreatment for this feedstock. The influence of temperature and acid concentration on BSG was studied and the optimal conditions were found to be 155 ºC and 2% H₃PO₄. The use of both pretreatment and enzymatic hydrolysis together recovered 92% of total sugars in BSG, mainly solubilized in the prehydrolysate (63%). Escherichia coli SL100 fermented this mixed sugar solution containing hemicellulosic sugars and starchy glucose without previous detoxification with an ethanol yield of 0.40 g/g. Considering also the glucose released from the cellulosic structure and converted to ethanol by a simultaneous saccharification and fermentation process, an overall ethanol yield of 17.9 g of ethanol per 100 g of raw BSG was achieved. Thereby, the process configuration proposed in this work allowed 69% of the total sugars in the BSG to be converted to ethanol.

General information
Publication status: Published
Organisations: Novo Nordisk Foundation Center for Biosustainability, Research Groups, Biomass Conversion and Bioprocess Technology, University of Jaén
Corresponding author: Romero, I.
Number of pages: 8
Pages: 52226-5233
Publication date: 2018
Peer-reviewed: Yes

Publication information
Journal: Energy and Fuels
Volume: 32
Issue number: 4
ISSN (Print): 0887-0624
Ratings:
BFI (2018): BFI-level 2
Scopus rating (2018): CiteScore 3.5
Web of Science (2018): Impact factor 3.021
Web of Science (2018): Indexed yes
Original language: English
DOI:
10.1021/acs.energyfuels.8b00343
Source: FindIt
Source ID: 2396938193
Research output: Contribution to journal › Journal article – Annual report year: 2018 › Research › peer-review