Comparison between wet oxidation and steam explosion as pretreatment methods for enzymatic hydrolysis of sugarcane bagasse - DTU Orbit (31/12/2018)

Comparison between wet oxidation and steam explosion as pretreatment methods for enzymatic hydrolysis of sugarcane bagasse

Alkaline wet oxidation and steam explosion pretreatments of sugarcane bagasse were compared with regard to biomass fractionation, formation of by-products, and enzymatic convertibility of the pretreated material. Wet oxidation led to the solubilisation of 82% of xylan and 50% of lignin, and to a two-fold increase of cellulose content in the pretreated solids, while steam explosion solubilised only 60% of xylan and 35% of lignin and increased cellulose content in the solid material by one third. Wet oxidation formed more aliphatic acids and phenolics, and less furan aldehydes in the liquid fraction than steam explosion did. A better enzymatic convertibility of cellulose was achieved for the wet-oxidised material (57.4 %) than for the steam-exploded material (48.9 %). Cellulose convertibility was lower for the whole slurry than for the washed solids in both pretreatments, but more significantly in steam explosion. This investigation demonstrates the potential of wet oxidation as a promising pretreatment method for enzyme-based bagasse-to-ethanol processes.

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy, Bioenergy and Biomass, Biosystems Division
Contributors: Medina, C. M., Marcet, M., Thomsen, A. B.
Pages: 670-683
Publication date: 2008
Peer-reviewed: Yes

Publication information
Journal: BioResources
Volume: 3
Issue number: 3
ISSN (Print): 1930-2126
Ratings:
Web of Science (2018): Indexed yes
Scopus rating (2017): CiteScore 1.39 SJR 0.405 SNIP 0.756
Web of Science (2017): Impact factor 1.202
Web of Science (2017): Indexed yes
Scopus rating (2016): CiteScore 1.53 SJR 0.493 SNIP 0.877
Web of Science (2016): Impact factor 1.321
Scopus rating (2015): CiteScore 1.43 SJR 0.534 SNIP 0.924
Web of Science (2015): Impact factor 1.334
Web of Science (2015): Indexed yes
Scopus rating (2014): CiteScore 1.67 SJR 0.695 SNIP 1.048
Web of Science (2014): Impact factor 1.425
Scopus rating (2013): CiteScore 1.72 SJR 0.634 SNIP 1.119
Web of Science (2013): Impact factor 1.549
ISI indexed (2013): ISI indexed yes
Scopus rating (2012): CiteScore 1.52 SJR 0.613 SNIP 1.08
Web of Science (2012): Impact factor 1.309
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
Scopus rating (2011): CiteScore 1.64 SJR 0.522 SNIP 1.065
Web of Science (2011): Impact factor 1.328
ISI indexed (2011): ISI indexed yes
Scopus rating (2010): SJR 0.615 SNIP 1.124
Web of Science (2010): Impact factor 1.418
Scopus rating (2009): SJR 0.452 SNIP 1.099
Scopus rating (2008): SJR 0.368 SNIP 0.825
Original language: English
Keywords: Pretreatment, Enzymatic hydrolysis, Steam explosion, Wet oxidation, Sugarcane bagasse, Ethanol
Source: orbit
Source-ID: 243870
Research output: Research - peer-review › Journal article – Annual report year: 2008