Carbohydrate analysis of hemicelluloses by gas chromatography-mass spectrometry of aceteylated methyl glycosides - DTU Orbit (04/10/2019)

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A method based on gas chromatography–mass spectrometry analysis of aceteylated methyl glycosides was developed in order to analyze monosaccharides obtained from various hemicelluloses. The derivatives of monosaccharide standards, arabinose, glucose, and xylose were studied in detail and 13C-labeled analogues were used for identification and quantitative analysis. Excellent chromatographic separation of the monosaccharide derivatives was found and identification of the anomeric configuration was feasible through a prepared and identified pure methyl 2,3,4,6-tetra-O-acetyl-β-D-glucopyranoside. The electron ionization mass spectrum and fragmentation path was studied for each monosaccharide derivative. Fragment ion pairs of labeled and unlabeled monosaccharides were used for quantification; m/z 243/248 for glucose, 128/132 for xylose, and 217/218 for arabinose. Using the intensity ratios obtained from the extracted ion chromatograms, accurate quantification of monosaccharide constituents of selected hemicelluloses was demonstrated.

General information
Publication status: Published
Organisations: Department of Chemical and Biochemical Engineering, CHEC Research Centre, The Danish Polymer Centre
Contributors: Sárossy, Z., Plackett, D., Egsgaard, H.
Pages: 1923-1930
Publication date: 2012
Peer-reviewed: Yes

Publication information
Journal: Analytical and Bioanalytical Chemistry
Volume: 403
ISSN (Print): 1618-2642
Ratings:
BFI (2012): BFI-level 1
Scopus rating (2012): CiteScore 3.51 SJR 1.354 SNIP 1.281
Web of Science (2012): Impact factor 3.659
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
Original language: English
DOIs:
10.1007/s00216-012-6038-z
Source: dtu
Source ID: u::3791

Research output: Contribution to journal › Journal article – Annual report year: 2012 › Research › peer-review