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Agilent PL aquagel-OH Analytical

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Clinical research

Synergic anti-tumor activity of gamma-irradiated exo-polysaccharide from submerged culture of *Grifola frondosa*

Journal of Medicinal Plants Research, **5**, 2378-2386 (2011)
Keyong Ho Lee, Choa Hyung Cho, Ki-Hyeong Rhee

Tags
PL aquagel-OH 60, PL aquagel-OH 40, PL aquagel-OH 30, clinical research

Abstract
Gel permeation chromatography was used to monitor changes in molecular weight distribution of polysaccharides in dry form using Agilent PLaquagel-60, 40 and 30 columns. Published by Academic Journals.

Energy and chemicals

Studies on the Starch and Hemicelluloses Fractionated by Graded Ethanol Precipitation from Bamboo Phyllostachys bambusoides f. shouzhu Yi

Journal of Agricultural and Food Chemistry, **59**, 2680-2688 (2011)
Pai Peng *et al.*

Tags
PL aquagel-OH 50, energy and chemicals, biofuels and alternative energy

Abstract
Starch from bamboo *Phyllostachys bambusoides* f. *shouzhu* Yi evaluated by means of solid-state 13C CP/MAS NMR and X-ray diffraction showed a typical B-type pattern with a very low degree of crystallinity (10.9%). In addition to starch, alkali-soluble hemicelluloses were further fractionated by graded precipitation at ethanol concentrations of 0 (HA), 15, 30, 45, 60, and 75% (v/v). Chemical composition and structural features of the six hemicellulosic subfractions were investigated by a combination of sugar analysis, GPC, FT-IR, GC-MS, 1D (1H and 13C) and 2D (HSQC) NMR spectra, and thermal analysis. The results showed that the bamboo hemicelluloses were O-acetylated 4-O-methyl-glucuronoarabinoxylans (GAX) consisting of a linear (1⟶4)-β-d-xylopyranosyl backbone decorated with branches at O-3 of α-l-arabinofuranosyl (5–12 mol %) or at O-2 of 4-O-methylglucuronic acid units and acetyl groups (0.8–11 mol %). The molecular weights of these polysaccharides ranged between 13400 and 67500 g/mol, and the molar ratios of A/X and G/X increased with ascending ethanol concentrations. Moreover, xylo-oligosaccharides (XOS) with DP 1–6 were produced by enzymatic hydrolysis of hemicelluloses and the total yields of XOS were range of 21.5 to 40.6%. The structure–property relationships were also established in order to improve enzyme accessibility. Reprinted with permission from Journal of Agricultural and Food Chemistry.

Materials testing and research

Characterizing String-of-Pearls Colloidal Silica by Multidetector Hydrodynamic Chromatography and Comparison to Multidetector Size-Exclusion Chromatography, Off-Line Multiangle Static Light Scattering, and Transmission Electron Microscopy

Analytical Chemistry, **83**, 3068-3075 (2011)
Amanda K. Brewer, André M. Striegel

Tags
PL aquagel-OH 50, PL aquagel-OH 60, materials testing and research, polymers, plastics and composites

Abstract
The string-of-pearls-type morphology is ubiquitous, manifesting itself variously in proteins, vesicles, bacteria, synthetic polymers, and biopolymers. Characterizing the size and shape of analytes with such morphology, however, presents a challenge, due chiefly to the ease with which the "strings" can be broken during chromatographic analysis or to the paucity of information obtained from the benchmark microscopy and off-line light scattering methods. Here, we address this challenge with multidetector hydrodynamic chromatography (HDC), which has the ability to determine, simultaneously, the size, shape, and compactness and their distributions of string-of-pearls samples. We present the quadruple-detector HDC analysis of colloidal string-of-pearls silica, employing static multiangle and quasielastic light scattering, differential viscometry, and differential refractometry as detection methods. The multidetector approach shows a sample that is broadly polydisperse in both molar mass and size, with strings ranging from two to five particles, but which also contains a high concentration of single, unattached "pearls". Synergistic combination of the various size parameters obtained from the multiplicity of detectors employed shows that the strings with higher degrees of polymerization have a shape similar to the theory-predicted shape of a Gaussian random coil chain of nonoverlapping beads, while the strings with lower degrees of polymerization have a prolate ellipsoidal shape. The HDC technique is contrasted experimentally with multidetector size-exclusion chromatography, where, even under extremely gentle conditions, the strings still degraded during analysis. Such degradation is shown to be absent in HDC, as evidenced by the fact that the molar mass and radius of gyration obtained by HDC with multiangle static light scattering detection (HDC/MALS) compare quite favorably to those determined by off-line MALS analysis under otherwise identical conditions. The multidetector HDC results were also comparable to those obtained by transmission electron microscopy (TEM). Unlike off-line MALS or TEM, however, multidetector HDC is able to provide complete particle analysis based on the molar mass, size, shape, and compactness and their distributions for the entire sample population in less than 20 min. Reprinted with permission from Analytical Chemistry © 2011 American Chemical Society.

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