



# Bibliography on carbohydrate polymers

## 1 BOOKS, REVIEWS & SYMPOSIA

BIORESOURCE TECHNOL 1992, 32 (2)

Special Issue - Papers from the IEA Workshop - Biotechnology for the Conversion of Lignocellulosics, Lund, Sweden

## 2 CELLULOSE

Areas EPG, Galebeck F\*\*/Univ Estadual Campinas, Inst Quim, BR-13100 Campinas, SP, Brazil

J COLLOID INTERFACE SCI 1991, 147 (2) 370

Adsorption of carboxymethylcellulose onto hydroxylapatite

Akhmadeev IR, Gumerov FM, Sopin VF, Marchenko GN//Kazan Chem Prod Res Inst, Kazan, Russia

VYSOKOMOL SOEDIN SER B SSSR 1991, 3 (7) 543

Study of phase equilibria in the cellulose nitrate acetone system by the spin probe method

Budtova TV, Belnikovich NG, Belyaev VM, Panov YN, Frenkel SY//Acad Sci, Inst Macromolec Cpds, Leningrad, Russia

VYSOKOMOL SOEDIN SER B SSSR 1991, 3 (7) 520

On features of complex formation between polyacrylic acid and cellulose ester

Carlsson CMG, Strom G//Inst Surface Chem, Box 5607, S-11486 Stockholm, Sweden

LANGMUIR 1991, 7 (11) 2492

Reduction and oxidation of cellulose surfaces by means of cold plasma

Han MJ, Bhattacharyya D\*\*/Univ Kentucky, Dept Chem Engr, Lexington, Ky 40506, USA

J MEMBRANE SCI 1991, 62 (3) 325

Characterization of reverse osmosis cellulose acetate membranes by gas adsorption method - Effect of casting variables and chlorine damage

Haurand P, Zugenmaier P\*\*/Tech Univ Clausthal, Inst Phys Chem, Arnold Sommerfeld Str 4, W-3392 Clausthal Zellerfe, FRG

POLYMER 1991, 32 (16) 3026

Structure and phase behaviour of a lyotropic mesophase system - Cellulose tricarbonyl methyl acetoacetate

Hawkinson DE, Kohout E, Fornes RE, Gilbert RD//N Carolina State Univ, Fiber & Polymer Sci, Program, Raleigh, NC 27695, USA

J POLYM SCI B-POLYM PHYS 1991, 29 (13) 1599

Some further observations on the systems cellulose trifluoroacetic acid/CH<sub>2</sub>Cl<sub>2</sub> and cellulose triacetate TFA/CH<sub>2</sub>Cl<sub>2</sub>

Itoh T, Tsujii Y, Fukuda T, Miyamoto T, Ito S, Asada T, Yamamoto M//Kyoto Univ, Inst Chem Res, Uji, Kyoto 611, Japan

LANGMUIR 1991, 7 (11) 2803

Fluorescence spectroscopy for a cellulose trioctadecanoate monolayer at the air/water interface

Khlebtsov NG, Fomina VI, Sirota AI//Acad Sci, Inst Biochem & Plant & Microorganism Physiol, Saratov, Russia

COLLOID J USSR-ENGL TR 1991, 53 (1) 141

Electrooptical, adsorption, and aggregation properties of polymer containing cellulose dispersions

Konkina LN, Taganov NG, Ermakova VD, Morozov VA//NN Semenov Chem Phys Inst, Moscow, Russia

ZH FIZ KHM SSSR 1991, 65 (10) 2768

Application of chromatography with combined detection for investigation of nitrogen distribution in cellulose nitrates (Russian)

Masson JF, Manley RS\*\*/McGill Univ, Pulp & Paper Res Ctr, 3420 Univ St, Montreal, Quebec, Canada H3A 2A7

MACROMOLECULES 1991, 24 (25) 6670

Miscible blends of cellulose and poly(vinylpyrrolidone)

Nakhapetyan LA, Motina LI, Shvets F, Gradil I, Korobkov IV, Khushainov MR, Kuznetsov VP//All Union Biotechnol Res Inst, Moscow, Russia

ZH FIZ KHM SSSR 1991, 65 (10) 2713

Immunosorbents based on cellulose for isolation and treatment of biopolymers (Russian)

Sakai K, Uprichard JM//Kyushu Univ, Fac Agr, Wood Chem, Lab, Fukuoka 812, Japan

J FAC AGR KYUSHU UNIV 1991, 36 (1-2) 45

Ozone degradation of cellulose model compounds

Sapon IP, Tsapyuk EA, Bryk MT//Acad Sci, Inst Colloid Chem & Chem Water, Kiev, Ukraine

COLLOID J USSR-ENGL TR 1991, 53 (1) 121

Effect of a nonionogenic surfactant on retention of potassium chloride by cellulose acetate membranes

Schnabelrauch M, Heinze T, Klemm D\*, Nehls I, Kotz J//Univ Jena, Inst Organ Chem & Makromolek Chem, Humboldtstr 10, O-6900 Jena, FRG

POLYM BULL 1991, 27 (2) 147

Investigations on synthesis and characterization of carboxy-groups containing cellulose sulfates

Yamaguchi K, Hamamoto Y, Manabe S, Yamamoto N//Yamaguchi

As a service to subscribers, each issue of the Journal contains a bibliography of newly published material in the field of carbohydrate polymers. The bibliography is divided into ten sections: 1 Books, Reviews & Symposia; 2 Cellulose; 3 Cellulose-degrading Enzymes; 4 Cyclodextrins; 5 Lignin; 6 Polysaccharides - Named; 7 Polysaccharides - Other; 8 Lipopolysaccharides; 9 Starch; 10 Starch-degrading Enzymes. Within each section, articles are listed in alphabetical order with respect to the subject. When there are no publications to appear under one of these headings, that section will be omitted.

Univ, Sch Med, Inst Lab Anim, Dept Virol & Parasitol, Ube, Yamaguchi 755, Japan

J ELECTRON MICROSCI 1991, 40 (5) 337

Microparticle removability of the regenerated cellulose hollow fiber (BMM) - An electron microscopic evaluation

Arwidsson H, Hjelstuen O, Ingason D, Graffner C//Astra Lakemedel AB, S-15185 Sodertalje, Sweden

ACTA PHARM NORDICA 1991, 3 (4) 223

Properties of ethyl cellulose films for extended release. 3. Influence of process factors when using aqueous dispersions

Arwidsson H, Johansson B//Astra Lakemedel AB, S-15185 Sodertalje, Sweden

INT J PHARM 1991, 76 (1-2) 91

Application of intrinsic viscosity and interaction constant as a formulation tool for film coating. 3. Mechanical studies on free ethyl cellulose films, cast from organic solvents

Das SK//Univ Queensland, Dept Pharm, Queensland 4072, Australia

DRUG DEVELOP IND PHARM 1991, 17 (18) 2521

In vitro dissolution profile of theophylline loaded ethyl cellulose microspheres prepared by emulsification solvent evaporation

Jung HJG, Ralph J, Hatfield RD//USDA ARS, US Dairy Forage Res Ctr, Madison, WI 53706, USA

J SCI FOOD AGR 1991, 56 (4) 469

Degradability of phenolic acid hemicellulose esters - A model system

Vesely M, Ceppan M, Brezova V, Lapcik L//Slovak Tech Univ, Fac Chem Technol, Radlinskeho 9, CS-81237 Bratislava, Czechoslovakia

J PHOTOCHEM PHOTOBIOLOG A-CHEM 1991, 61 (3) 399

Photocatalytic degradation of hydroxyethylcellulose in aqueous Pt-TiO<sub>2</sub> suspension

Smith SG, Lindstrom RL//1700 Shallcross Ave, Suite 2, Wilmington, DE 19806, USA

J CATARACT REFRACT SURG 1991, 17 (6) 839

2% hydroxypropyl methylcellulose as a viscous surgical adjunct - A multicenter prospective randomized trial

Jimenez M, Gonzalez AE, Martinez MJ, Martinez AT, Dale BE//CSIC, Ctr Invest Biol, Velazquez 144, E-28006 Madrid, Spain

MYCOL RES 1991, 95 (NOV) 1299

Screening of yeasts isolated from decayed wood for lignocellulose-degrading enzyme activities

Kondo T, Gray DG\*\*//Pulp & Paper Res Inst Canada, 3420 Univ St, Montreal, Quebec, Canada H3A 2A7

CARBOHYD RES 1991, 220 (NOV) 173

The preparation of O-methyl-celluloses and O-ethyl-celluloses having controlled distribution of substituents

Govorkov AT, Bannova EA, Volkhonskaya LI, Sokolova GE, Fomina MP//Kemerovo State Univ, Kemerovo 650043, Russia

HIGH ENERG CHEM-ENGL TR 1991, 25 (3) 189

Radiative degradation of nitrocellulose

Merhari L, Lehue C, Belorgeot C, Bahna Z//Univ Limoges, Electr Polymeres Faisceaux Ion Lab, 123 Ave Albert Thomas, F-87060 Limoges, France

APPL PHYS LETT 1991, 59 (22) 2856

Ion implantation profile modeling of nitrocellulose coated substrates

### 3 CELLULOSE-DEGRADING ENZYMES

Baker WL, Panow A//Swinburne Inst Technol, Dept Chem, John St, Hawthorn, Vic 3122, Australia

J BIOCHEM BIOPHYS METH 1991, 23 (4) 265

Estimation of cellulase activity using a glucose-oxidase-Cu(II) reducing assay for glucose

Famurewa O, Olutiola PO//Ondo State Univ, Dept Microbiol, Ado Ekiti, Nigeria

FOLIA MICROBIOL PRAGUE 1991, 36 (4) 347

Comparison of growth and cellulolytic enzyme production in *Aspergillus chevalieri* and *Penicillium steckii* from mouldy cacao beans

Huang XL, Penner MH\*\*//Oregon State Univ, Dept Food Sci & Technol, Corvallis, OR 97331, USA

J AGR FOOD CHEM 1991, 39 (11) 2096

Apparent substrate inhibition of the *Trichoderma reesei* cellulase system

Kubicek-Pranz EM, Gsur A, Hayn M, Kubicek CP\*\*//Vienna Tech Univ, Inst Biochem Technol & Mikrobiol, Mikrobielle Biochem Abt, A-1040 Vienna, Austria

BIOTECHNOL APPL BIOCHEM 1991, 14 (3) 317

Characterization of commercial *Trichoderma reesei* cellulase preparations by denaturing electrophoresis (SDS-PAGE) and immunostaining using monoclonal antibodies

Kume S, Fujio Y\*\*//Kyushu Univ, Fac Agr, Food Proc Lab, 46-09, Fukuoka 812, Japan

J FAC AGR KYUSHU UNIV 1991, 36 (1-2) 37

Purification of neutral cellulase from a mixture of thermophilic bacilli

Marle I, Erlandsson P, Hansson L, Isaksson R, Pettersson C, Pettersson G\*\*//Univ Uppsala, Ctr Biomed, Dept Analyt Pharmaceut Chem, POB 574, S-75123 Uppsala, Sweden

J CHROMATOGR 1991, 586 (2) 233

Separation of enantiomers using cellulase (CBH-I) silica as a chiral stationary phase

Pompei R, Lampis G, Chiari M, Righetti PG\*\*//Univ Milano, Dept Biomed Sci & Technol, Via Celoria 2, I-20133 Milan, Italy

BIOTECHNIQUES 1991, 11 (6) 702

Culture of eukaryotic cells with macroreticulate buffers - Fermentation of cellulolytic fungi

Safarik I, Safarikova M//S Bohemian Biol Ctr, Analyt Chem Lab, Branisovska 31, CS-37005 Ceske Budejovice, Czechoslovakia

J BIOCHEM BIOPHYS METH 1991, 23 (4) 301

Black substrate for spectrophotometric determination of cellulase activity in coloured solutions

Suto M, Yachi M, Kamagata Y, Sasaki H, Takao S, Tomita F//Hokkaido Univ, Fac Agr, Dept Agr Chem, Sapporo, Hokkaido 060, Japan

J FERMENT BIOENG 1991, 72 (5) 352

Cellulase induction by soluble acetyl cellobioses in *Penicillium purpurogenum*

Smith DC, Forsberg CW\*\*//Univ Guelph, Dept Microbiol, Guelph, Ontario, Canada N1G 2W1

APPL ENVIRON MICROBIOL 1991, 57 (12) 3552

Alpha-glucuronidase and other hemicellulase activities of *Fibrobacter succinogenes*-S85 grown on crystalline cellulose or ball-milled barley straw

## 4 CYCLODEXTRINS

Ahmed SM, Naggi A, Guerrini M, Focher B//Univ Assiut, Fac Pharm, Dept Ind Pharm, Assiut, Egypt

INT J PHARM 1991, 77 (2-3) 247

Inclusion complexes of broprimine with beta-cyclodextrin in solution and in solid state

Bettinetti G, Melani F, Mura P, Monnanni R, Giordano F\*//Univ Pavia, Dipartimento Chim Farmaceut, I-27100 Pavia, Italy

J PHARM SCI 1991, 80 (12) 1162

<sup>13</sup>C nuclear magnetic resonance study of naproxen interaction with cyclodextrins in solution

Djedaini F, Perty B//CENS, Serv Chim Molec, F-91191 Gif Sur Yvette, France

J PHARM SCI 1991, 80 (12) 1157

Nuclear magnetic resonance investigation of the stoichiometries in beta-cyclodextrin-steroid inclusion complexes

Frankewich RP, Thimmaiah KN, Hinze WL\*//Wake Forest Univ, Dept Chem, Analyt Micellar Chem Lab, POB 7486, Winston Salem, NC 27109, USA

ANAL CHEM 1991, 63 (24) 2924

Evaluation of the relative effectiveness of different water-soluble beta-cyclodextrin media to function as fluorescence enhancement agents

Fujita K, Ishizu T, Minamiura N, Yamamoto T//Nagasaki Univ, Fac Pharmaceut Sci, Bunkyo machi, Nagasaki 852, Japan

CHEM LETT 1991, (11) 1889

Preparation and enzyme-based structure determination of 2(A), 6(E)-bis(O-disulfonyl)-beta-cyclodextrin

Fujita K, Yamamura H, Imoto T//Nagasaki Univ, Fac Pharmaceut Sci, Bunkyo machi, Nagasaki 852, Japan

TETRAHEDRON LETT 1991, 32 (46) 6737

A complete set of beta-cyclodextrins-6(A), 6(X)-diactivated by 2 different sulfonyl groups

Helm H, Backensfeld T, Muller BW\*, Waaler T//Univ Kiel, Dept Pharmaceut, Gutenbergstr 76-78, W-2300 Kiel 1, FRG

ACTA PHARM NORDICA 1991, 3 (4) 199

The preparation and characterization of digoxin beta-cyclodextrin and 2-hydroxypropyl-beta-cyclodextrin complex

Janz S, Shacter E//NCI, Genet Lab, Bldg 37, Rm 2B09, Bethesda, Md 20892, USA

TOXICOLOGY 1991, 69 (3) 301

A new method for delivering alkanes to mammalian cells - Preparation and preliminary characterization of an inclusion complex between beta-cyclodextrin and pristane (2,6,10,14-tetramethylpentadecane)

Kano K, Tatsumi M, Hashimoto S//Doshisha Univ, Fac Engrn, Dept Appl Chem, Kamikyo ku, Kyoto 602, Japan

J ORG CHEM 1991, 56 (23) 6579

Cyclodextrin-induced conformational enantiomerism of dinaphthylmethanes

Loftsson T, Fridriksdottir H, Olafsdottir BJ, Gudmundsson O//Univ Iceland, Dept Pharm, IS-101 Reykjavik, Iceland

ACTA PHARM NORDICA 1991, 3 (4) 215

Solubilization and stabilization of drugs through cyclodextrin complexation

Marques HMC, Hadgraft J, Kellaway IW\*, Taylor G//Univ Wales Coll Cardiff, Welsh Sch Pharm, POB 13, Cardiff CF1 3XF, Wales

INT J PHARM 1991, 77 (2-3) 297

Studies of cyclodextrin inclusion complexes. 3. The pulmonary absorption of beta-cyclodextrin, DM-beta-cyclodextrin and HP-beta-cyclodextrin in rabbits

Marques HMC, Hadgraft J, Kellaway IW\*, Taylor G//Univ Wales Coll Cardiff, Welsh Sch Pharm, POB 13, Cardiff CF1 3XF, Wales

INT J PHARM 1991, 77 (2-3) 303

Studies of cyclodextrin inclusion complexes. 4. The pulmonary absorption of salbutamol from a complex with 2-hydroxypropyl-beta-cyclodextrin in rabbits

Mavridis IM, Hadjoudis E, Tsoucaris G//NRCPS Demokritos, Inst Phys Chem, Aghia Paraskevi, GR-15310 Athens, Greece

CARBOHYD RES 1991, 220 (NOV) 11

The crystal structure of the inclusion complex of cyclomaltoheptaose (beta-cyclodextrin) with 3,3-dimethylbutylamine

Nuwer MJ, Odea JJ, Osteryoung JG\*//SUNY Buffalo, Dept Chem, Buffalo, NY 14260, USA

J PHYS CHEM 1991, 95 (24) 10070

Kinetics and thermodynamics of inclusion of para-nitrophenolate with alpha-cyclodextrin measured with pulse voltammetry

Schmarr HG, Mosandl A, Kaunzinger A//Univ Frankfurt, Inst Lebensmittelchem, Robert Mayer Str 7-9, W-6000 Frankfurt, FRG

J MICROCOLUMN SEP 1991, 3 (5) 395

Influence of derivatization on the chiral selectivity of cyclodextrins - Alkylated acylated cyclodextrins and gamma/delta-lactones as an example

Tsukushi I, Yamamuro O, Suga H//Osaka Univ, Fac Sci, Dept Chem, Toyonaka, Osaka 560, Japan

J THERM ANAL 1991, 37 (7) 1359

Solid state amorphization and glass transition of tri-o-methyl-beta-cyclodextrin

Usayapant A, Karara AH, Narurkar MM\*//NE Louisiana Univ, Sch Pharm, Div Pharmaceut & Med Chem, Monroe, La 71209, USA

PHARMACEUT RES 1991, 8 (12) 1495

Effect of 2-hydroxypropyl-beta-cyclodextrin on the ocular absorption of dexamethasone and dexamethasone acetate

Yamamura H, Fujita K//Fukuyama Univ, Fac Pharmaceut Sci, Sanzo, Higashimura cho, Fukuyama 72902, Japan

CHEM PHARM BULL TOKYO 1991, 39 (10) 2505

Preparation of heptakis[6-O-(para-tosyl)]-beta-cyclodextrin and heptakis[6-O-(para-tosyl)]-2-O-(para-tosyl)-beta-cyclodextrin and their conversion to heptakis(3,6-anhydro)-beta-cyclodextrin

Yatsimirsky AK, Eliseev AV//MV Lomonosov State Univ, Dept Chem, Moscow 119899, Russia

J CHEM SOC PERKIN TRANS II 1991, (11) 1769

Contributions of electrostatic and hydrophobic interactions to the host guest complexation of pyrocatecholate anions with cationic cyclodextrins

## 5 LIGNIN

Dey S, Maiti TK, Bhattacharyya BC//Indian Inst Technol, Dept Chem Engrn, Biotechnol Unit, Kharagpur 721302, W Bengal, India

J FERMENT BIOENG 1991, 72 (5) 402

Lignin peroxidase production by a brown-rot fungus Polyporus ostreiformis

Guo ZX, Gandini A\*//Ecole Francaise Papeterie, Inst Natl Polytech

Grenoble, Mat Polymer Lab, BP65, F-38402 St Martin D'heres, France  
 EUR POLYM J 1991, 27 (11) 1177  
 Polyesters from lignin. 2. The copolyesterification of Kraft lignin and polyethylene glycols with dicarboxylic acid chlorides

Hartig C, Lorber H//Inst Biotechnol Leipzig, Permoserstr 15, O-7050 Leipzig, FRG  
 MATER ORGAN 1991, 26 (1) 31  
 Microorganisms for the bioconversion of lignin (German, English Abstract)

Kling SH, Neto JSA//Univ Fed Rio de Janeiro, Escola Quim, Cidade Univ, Ilha Fundao, BR-21945 Rio de Janeiro, Brazil  
 J BIOTECHNOL 1991, 21 (3) 295  
 Oxidation of methylene blue by crude lignin peroxidase from *Phanerochaete chrysosporium*

## 6 POLYSACCHARIDES - NAMED

Depinto GL//Univ Zulia, Fac Humanidades & Educ, Invest Quim Lab, Apdo 526, Maracaibo, Venezuela  
 CARBOHYD RES 1991, 220 (NOV) 229  
<sup>13</sup>C NMR-spectral study of Acacia xanthophloea gum and its degradation products

Perlman D//Brandeis Univ, Rosenstiel Res Ctr, Waltham, Ma 02254, USA  
 BIOTECHNIQUES 1991, 11 (6) 754  
 A synergistic gelling and sieving agent for gel electrophoresis in normal and low melting temperature agarose

Hassan RM//Univ Assiut, Fac Sci, Dept Chem, Assiut, Egypt  
 J MATER SCI 1991, 26 (21) 5806  
 Alginate polyelectrolyte ionotropic gels. 3. Kinetics of exchange of chelated divalent transition metal ions especially cobalt(II) and copper(II) by hydrogen ions in capillary ionotropic metal alginate polymembrane gels

Hertzberg S, Kvittingen L, Anthonsen T, Skjakbraek G//Univ Trondheim, Norwegian Inst Technol, Div Biotechnol, Norwegian Biopolymer Lab, N-7034 Trondheim, Norway  
 ENZYME MICROB TECHNOL 1992, 14 (1) 42  
 Alginate as immobilization matrix and stabilizing agent in a 2-phase liquid system - Application in lipase-catalysed reactions

Wang ZY, Zhang QZ, Konno M, Saito S//Tohoku Univ, Dept Molec Chem & Engn, Sendai, Miyagi 980, Japan  
 CHEM PHYS LETT 1991, 186 (4-5) 463  
 Sol-gel transition of alginate solution by additions of various divalent cations - Critical behavior of relative viscosity

Wheatley MA, Chang M, Park E, Langer R//Drexel Univ, Dept Chem Engn, Philadelphia, Pa 19104, USA  
 J APPL POLYM SCI 1991, 43 (11) 2123  
 Coated alginate microspheres - Factors influencing the controlled delivery of macromolecules

Yilmazer G, Kokini JL//Rutgers State Univ, Dept Food Sci, New Jersey Agr Expt Stn, New Brunswick, NJ 08903, USA  
 J TEXTURE STUD 1991, 22 (3) 289  
 Effect of polysorbate-60 on the stability of O/W emulsions stabilized by propylene glycol alginate and xanthan gum

Yokoyama F, Achife EC, Matsuoka M, Shimamura K, Yamashita Y, Monobe K//Okayama Univ, Fac Engn, Dept Appl Chem, Okayama

700, Japan  
 POLYMER 1991, 32 (16) 2911  
 Morphology of oriented calcium alginate gels obtained by the flow-gelation method

Van der Veen P, Flipphi MJA, Voragen AGJ, Visser J\*//Agr Univ Wageningen, Dept Genet, Dreyenlaan 2, 6703 HA Wageningen, The Netherlands  
 ARCH MICROBIOL 1991, 157 (1) 23  
 Induction, purification and characterisation of arabinases produced by *Aspergillus niger*

Bengtsson S, Aman P, Andersson RE//Swedish Univ Agr Sci, Dept Food Sci, S-750 07 Uppsala, Sweden  
 CARBOHYD POLYM 1992, 17 (4) 277  
 Structural studies on water-soluble arabinoxylans in rye grain using enzymatic hydrolysis

Arakawa S, Ishihara H, Bishio O, Isomura S//Nagoya City Univ, Fac Pharmaceut Sci, Dept Hyg Chem, Nagoya, Aichi 467, Japan  
 J SCI FOOD AGR 1991, 57 (1) 135  
 A sandwich enzyme-linked immunosorbent assay for kappa-carrageenan determination

Turquois T, Rochas C, Taravel FR//Ctr Rech Macromol Veg, CNRS, BP 53 X, F-38041 Grenoble Cedex, France  
 CARBOHYD POLYM 1992, 17 (4) 263  
 Rheological studies of synergistic kappa carrageenan-carob galactomannan gels

Yabe Y, Ninomiya T, Tatsuno T, Okada T//Japan Food Hyg Assoc, Inst Food Hyg, 6-1 Jingu mae, 2 Chome, Shibuya ku, Tokyo 150, Japan  
 J ASSN OFFIC ANAL CHEM 1991, 74 (6) 1019  
 Simple colorimetric determination of carrageenan in jellies and salad dressings

Sudoh M, Shimada H, Arisawa M, Yano K, Takagi M//Nippon Roche Res Ctr, Dept Chemotherapy & Biochem, Kajiura 200, Kamakura, Kanagawa 247, Japan  
 AGR BIOL CHEM TOKYO 1991, 55 (1) 2901  
 Yeast flocculation mediated by over-expression of the chitin synthase-2 gene in *Saccharomyces cerevisiae*

Lehr CM, Schacht EH, Junginger HE//Ctr Biopharmaceut Sci, Div Pharmaceut Technol, Einsteinweg 5, 2300 RA Leiden, The Netherlands  
 INT J PHARM 1992, 78 (1) 43  
 In vitro evaluation of mucoadhesive properties of chitosan and some other natural polymers

Bhattacharjee MK, Mayer RM//Univ Texas, Dept Microbiol, Austin, Tx 78712, USA  
 BIIORG CHEM 1991, 19 (4) 445  
 Monosaccharide acceptor substrate specificity of dextranase

Flexner C, Barditchcrovo PA, Kornhauser DM, Farzadegan H, Nerhood LJ, Chaisson RE, Bell KM, Lorentsen KJ, Hendrix CW, Petty BG et al//Johns Hopkins Univ, Sch Med, Dept Med, Div Clin Pharmacol, Baltimore, Md 21205, USA  
 ANTIMICROB AGENTS CHEMOTHER 1991, 35 (12) 2544  
 Pharmacokinetics, toxicity, and activity of intravenous dextran sulfate in human immunodeficiency virus infection

PHARMACOPEIAL FORUM 1991, 17 (6) 2681  
 Dextran 40 and dextran 70 - Comments Received

Araujo A, Ward OP\*\*/Univ Waterloo, Dept Biol, Waterloo, Ontario, Canada N2L 3G1

J IND MICROBIOL 1991, 8 (4) 229

Studies on the galactomannan-degrading enzymes produced by *Sporotrichum cellulosophilum*

Martins LO, Sacorreia I\*\*/Inst Super Tecn, Engn Bioquim Lab, Av Rovisco Pais, P-1096 Lisbon, Portugal

BIOTECHNOL APPL BIOCHEM 1991, 14 (3) 357

Gellan gum biosynthetic enzymes in producing and nonproducing variants of *Pseudomonas elodea*

Kasai S, Fujimoto S, Nitta K, Baba H, Kunimoto T/Eisai & Co Ltd, Eisai Tsukuba Res Labs, 5-1-3 Tokodai, Tsukuba, Ibaraki 30026, Japan

J PHARMACOBIO-DYNAMICS 1991, 14 (9) 519

Antitumor activity of polymorphonuclear leukocytes activated by a beta-1,3-D-glucan

Kolios G, Papadopoulos GK, Roussis I, Drinas C/Univ Ioannina, Dept Chem, Sector Organ Chem & Biochem, GR-45110 Ioannina, Greece

BIOTECHNOL APPL BIOCHEM 1991, 14 (3) 265

Immunological versatility and carbon regulation of *Cellulomonas fimi* endo-1,4-beta-glucanases

Williams DL, Pretus HA, McNamee RB, Jones EL, Ensley HE, Browder IW, Diluzio NR/Tulane Univ, Sch Med, Dept Physiol, Glucan Res Lab, 1430 Tulane Ave, New Orleans, La 70112, USA

IMMUNOPHARMACOLOGY 1991, 22 (3) 139

Development, physicochemical characterization and preclinical efficacy evaluation of a water soluble glucan sulfate derived from *Saccharomyces cerevisiae*

Okada M, Yamakawa Y, Sumitomo H/Nagoya Univ, Fac Agr, Chikusa ku, Nagoya 46401, Japan

MACROMOLECULES 1991, 24 (25) 6797

Chemical synthesis of (1-3)-beta-D-glucopyranan by ring-opening polymerization of a 1,3-anhydro sugar derivative

Zang LH, Howseman AM, Shulman RG/Yale Univ, Dept Molec Biophys & Biochem, New Haven, Ct 06510, USA

CARBOHYD RES 1991, 220 (NOV) 1

Assignment of the H-1 chemical shifts of glycogen

Anderson DMW, Millar JRA, Wang WR/Univ Edinburgh, Dept Chem, Edinburgh EH9 3JJ, Scotland

BIOCHEM SYST ECOL 1991, 19 (6) 447

Gum arabic (*Acacia senegal*) from Niger - Comparison with other sources and potential agroforestry development

Anderson DMW, Millar JRA, Weiping W/Univ Edinburgh, Dept Chem, Edinburgh EH9 3JJ, Scotland

FOOD ADDIT CONTAM 1991, 8 (4) 405

Gum arabic (*Acacia senegal*) - Unambiguous identification by <sup>13</sup>C-NMR spectroscopy as an adjunct to the revised JECFA specification, and the application of <sup>13</sup>C-NMR spectra for regulatory legislative purposes

Anderson DMW, Millar JRA, Weiping W/Univ Edinburgh, Dept Chem, Edinburgh EH9 3JJ, Scotland

FOOD ADDIT CONTAM 1991, 8 (4) 423

The gum exudate from *Combretum nigrans* gum, the major source of West African gum combretum

Ampofo SA, Wang HM, Linhardt RJ\*\*/Univ Iowa, Coll Pharm, Div

Med & Nat Prod Chem, Iowa City, Ia 52242, USA

ANAL BIOCHEM 1991, 199 (2) 249

Disaccharide compositional analysis of heparin and heparan sulfate using capillary zone electrophoresis

Kristensen HI, Tromborg EM, Nielsen JR, Nielsen JI, Johansen KB, Ostergaard PB//Novo Nordisk, Heparin Res Lab, DK-2820 Gentofte, Denmark

THROMB RES 1991, 64 (2) 131

Development and validation of a size exclusion chromatography method for determination of molecular masses and molecular mass distribution in low molecular weight heparin

Moffat CF, McLean MW, Long WF, Williamson FB//MAFF, Torry Res Stn, 135 Abbey Rd, Aberdeen AB9 8DG, Scotland

EUR J BIOCHEM 1991, 202 (2) 531

Heparinase-II from *Flavobacterium heparinum* - HPLC analysis of the saccharides generated from chemically modified heparins

Priollet P, Alhencgas M, Aiach M//Hop St Joseph, Serv Hypertens Arterielle Med Vasc & Med Interne, F-75674 Paris 14, France

SEM HOP PARIS 1991, 67 (40-41) 1806

Limitations of low-molecular weight heparins (French, English Abstract)

Rosenfeld L, Prior MT, Girardi LM//New York Med Coll, Dept Pediat, Div Neonatal Perinatal Med, Neonatal Res Lab, Valhalla, NY 10595, USA

THROMB RES 1991, 64 (2) 203

Comparison of the separation of bovine heparin by strong anion exchange and by gel filtration chromatography

Pietrogrande V, Melanotte PL, Dagnolo B, Ulivi M, Benigni GA, Turchetto L, Pierfederici P, Perbellini A//Fidia Res Labs, Dept Tissue Repair, I-35031 Abano Terme, Italy

CURR THER RES 1991, 50 (5) 691

Hyaluronic acid versus methylprednisolone intra-articularly injected for treatment of osteoarthritis of the knee

Wik HB//Biomed Ctr, Fac Pharm, Dept Phys Pharmaceut Chem, Box 574, S-75123 Uppsala, Sweden

ACTA PHARM NORDICA 1991, 3 (4) 256

Rheological studies of sodium hyaluronate in pharmaceutical preparations

Delanghe J, Bellon J, Debuyzere M, Van Daele G, Lerouxroels G//State Univ Ghent Hosp, Cent Lab, de Pintelaan 185-1B2, B-9000 Ghent, Belgium

CLIN CHEM 1991, 37 (11) 2017

Elimination of glucose interference in enzymatic determination of inulin

Jung K, Henke W, Schulze BD, Sydow K, Precht K, Klotzek S//Humboldt Univ, Hosp Charite, Leninalle 49, O-1017 Berlin, FRG

NEPHRON 1991, 59 (4) 694

Single injection inulin clearance using only one blood sample as a suitable procedure to measure glomerular filtration rate

Lagade P, Onter N, Fady C, Reisser D, Lejeune P, Jeannin JF//Natl Inst Med Res, F-21000 Dijon, France

EKSP ONKOL 1991, 13 (5) 43

Therapeutic effects of endotoxin, lentinan and OK-432 on rat peritoneal carcinomatosis role of macrophage (Russian, English Abstract)

Shimizu N, Asahara H, Tomoda M\*, Gonda R, Ohara N//Kyoritsu Coll Pharmaceut Sci, Shibakoen, Minato ku, Tokyo 105, Japan

CHEM PHARM BULL TOKYO 1991, 39 (10) 2630

Constituents of the seed of *Malva verticillata*. 7. Structural features and reticuloendothelial system-potentiating activity of MVS-I, the major neutral polysaccharide

Ghanem KM, El-Refai AH, El-Gazaerly MA//Univ Alexandria, Fac Sci, Dept Bot, Alexandria, Egypt

RESOUR CONSERV RECYCL 1991, 6 (1) 35

Microbial extraction of beet pulp pectin

King K//Dept Agr, Div Food & Agr Chem Res, Belfast BT4 3SB, Northern Ireland

J SCI FOOD AGR 1991, 57 (1) 43

Characteristics of pectinesterase isolated from bramley apple waste

Leuchtenberger A, Mayer G//Cent Inst Nutr, Arthur Scheunert Allee 114-116, W-1505 Bergholz Rehbrücke, FRG

ENZYME MICROB TECHNOL 1992, 14 (1) 18

Changed pectinase synthesis by aggregated mycelium of some *Aspergillus niger* mutants

Leuchtenberger A, Mayer G//Cent Inst Nutr, Arthur Scheunert Allee 114-116, W-1505 Bergholz Rehbrücke, FRG

FOLIA MICROBIOL PRAGUE 1991, 36 (4) 362

Synthesis of different pectinases by filamentous growing *A-niger* mutants

Salmeron MC, Artes F//CSIC, Ctr Edafol & Biol Aplicada Segura, Dept Postrecolecc, Murcia, Spain

AGROCHIMICA 1991, 35 (4) 289

Physicochemical parameters and enzyme activity (pectin methylesterase and polygalacturonase) of the Maruja peach and the Armking nectarine in a controlled atmosphere (Spanish, English Abstract)

Tsuji M, Komiyama Y//Yamanashi Ind Technol Ctr, Dept Wine & Food Technol, 312-4 Isawa cho, Yamanashi 406, Japan

J JPN SOC FOOD SCI TECHNOL 1991, 38 (11) 1013

Changes in pectic substances and pectin-degrading enzyme activities of plum fruits during storage at 30-degrees-C (Russian, English Abstract)

Ulgren N, Ozilgen M//Middle E Tech Univ, Dept Food Engrn, Ankara 06531, Turkey

J SCI FOOD AGR 1991, 57 (1) 93

Kinetic compensation relations for ascorbic acid degradation and pectinesterase inactivation during orange juice pasteurisation

Vinkx CJA, Van Nieuwenhove CG, Delcour JA//Katholieke Univ Leuven, Toegepaste Organ Scheikunde Lab, Kardinaal Mercierlaan 92, B-3001 Heverlee, Belgium

CEREAL CHEM 1991, 68 (6) 617

Physicochemical and functional properties of rye nonstarch polysaccharides. 3. Oxidative gelation of a fraction containing water-soluble pentosans and proteins

Biswas GK, Chakrabarty M, Bhattacharyya P//Bose Inst, Dept Chem, 931 Apc Rd, Calcutta 700009, W Bengal, India

INDIAN J CHEM SECT B 1991, 30 (11) 1059

Efficient synthesis of sulphones using polysorbate-80 as phase transfer catalyst

Ilic L, Jeremic K\*, Jovanovic S//Fac Technol & Met Belgrade, Karadjieva 4-IV, YU-1100 Belgrade, Yugoslavia

EUR POLYM J 1991, 27 (11) 1227

Kinetics of pullulan depolymerization in hydrochloric acid

Ohno H, Higano M//Tokyo Univ Agr & Technol, Dept Biotechnol,

Koganei, Tokyo 184, Japan

POLYMER 1991, 32 (16) 3062

Simple coacervate of pullulan formed by the addition of poly(ethylene oxide) in an aqueous solution

Zentz F, Verchere J-F, Muller G\*\*//Fac Sci, URA 500 CNRS Polym Biopolym Membrane, BP 118, F-76134 Mont St Aignan, France

CARBOHYD POLYM 1992, 17 (4) 289

Thermal denaturation and degradation of schizophyllan

Ouriagli TE, Francois J, Sarazin D\*, Dinh NT\*\*//Inst Charles Sadron, CNRS Univ Louis Pasteur, 6 rue Boussingault, F-67083 Strasbourg Cedex, France

CARBOHYD POLYM 1992, 17 (4) 305

Influence of nonionic surfactant on aggregation state of scleroglucan in aqueous solution

Dumitriu S, Dumitriu M//Inst Polytech Gheorghe Asachi, 11 Bul Copeu, R-6600 Iasi, Romania

BIOMATERIALS 1991, 12 (9) 821

Bioactive polymers. 66. Theophylline retardation in xanthan-based hydrogels

Gamini A, Debleijser J, Leyte JC\*\*//Leiden Univ, Gorlaeus Labs, Dept Phys & Macromolec Chem, POB 9502, 2300 RA Leiden, The Netherlands

CARBOHYD RES 1991, 220 (NOV) 33

Physico-chemical properties of aqueous solutions of xanthan - An NMR study

Takada Y, Sato T\*, Teramoto A//Osaka Univ, Dept Macromolec Sci, Toyonaka, Osaka 560, Japan

MACROMOLECULES 1991, 24 (23) 6215

Dynamics of stiff-chain polymer in isotropic solution. 2. Viscosity of aqueous solutions of xanthan, a rigid double-helical polysaccharide

Bahkali AH//King Saud Univ, Coll Sci, Dept Bot & Microbiol, POB 2455, Riyadh 11451, Saudi Arabia

MICROBIOLOGICA 1991, 14 (4) 363

Production of xylanase by *Verticillium dahliae*

Bahkali AH//King Saud Univ, Coll Sci, Dept Bot & Microbiol, POB 2455, Riyadh 11451, Saudi Arabia

J BASIC MICROBIOL 1991, 31 (5) 323

Production of xylanase by *Verticillium albo-atrum* in the presence of polymeric substances

Ghosh M, Nanda G\*\*//Bose Inst, Dept Microbiol, 93-1 Apc Rd, Calcutta 700009, W Bengal, India

BIOTECHNOL LETT 1991, 13 (11) 807

Immobilized *Aspergillus sydowii* produces xylanase

Lin LL, Thomson JA//Univ Cape Town, Dept Microbiol, Rondebosch 7700, South Africa

FEMS MICROBIOL LETT 1991, 84 (2) 197

An analysis of the extracellular xylanases and cellulases of *Butyrivibrio fibrisolvens* H17c

Mathrani IM, Ahring BK\*\*//Tech Univ Denmark, Dept Biotechnol, Anaerob Microbiol Biotechnol Res Grp, Bldg 223, DK-2800 Lyngby, Denmark

ARCH MICROBIOL 1991, 157 (1) 13

Isolation and characterization of a strictly xylan-degrading dictyoglomus from a man-made, thermophilic anaerobic environment

Matsuo N, Yoshida S, Kusakabe I\*, Murakami K//Univ Tsukuba,

Inst Appl Biochem, Tsukuba, Ibaraki 305, Japan  
AGR BIOL CHEM TOKYO 1991, 55 (1) 2905  
Chemical structure of xylan in cotton-seed cake

Simkovic I, Mlynar J, Alföldi J//Slovak Acad Sci, Inst Chem, 84238 Bratislava, Czechoslovakia

CARBOHYD POLYM 1992, 17 (4) 285

Modification of corn cob meal with quarternary ammonium groups

## 7 POLYSACCHARIDES - OTHER

Bagasra O, Whittle P, Heins B, Pomerantz RJ//Thomas Jefferson Univ Jefferson Med Coll, Dept Med, Div Infect Dis, 1025 Walnut St, Suite 813, Philadelphia, Pa 19107, USA

J INFEC DIS 1991, 164 (6) 1082

Anti-human immunodeficiency virus type-1 activity of sulfated monosaccharides - Comparison with sulfated polysaccharides and other polyions

Betaneli VI, Ott AY//ND Zelinskii Organ Chem Inst, Moscow, Russia  
BIOORG KHIM 1991, 17 (10) 1390

An approach to the chemical synthesis of the natural capsular polysaccharide from *Streptococcus pneumoniae* Type-3 (Russian, English Abstract)

Beynon LM, Richards JC, Perry MB//Natl Res Council Canada, Inst Biol Sci, Ottawa, Ontario, Canada K1A 0R6

CARBOHYD RES 1991, 220 (NOV) 185

Structure of the capsular polysaccharide from *Actinobacillus pleuropneumoniae* serotype-10

Eliseyeva GI, Ivanova IA, Nikolaev AV, Shibaev VN//ND Zelinskii Organ Chem Inst, Moscow, Russia

BIOORG KHIM 1991, 17 (10) 1401

Fragments of biopolymers containing glycosyl phosphate residues. 8. Hydrogen phosphonate synthesis of glycosyl phosphosugars containing alpha-D-glucopyranosyl phosphate and 2-acetamido-2-deoxy-alpha-D-glycopyranosyl phosphate residues, fragments of bacteria capsular antigens and of glycoproteins (Russian, English Abstract)

Fontaine T, Talmont F, Dutton GGS, Fournet B\*\*//Univ Lille 1, Chim Biol Lab, F-59655 Villeneuve Dascq, France

ANAL BIOCHEM 1991, 199 (2) 154

Analysis of pyruvic acid acetal containing polysaccharides by methanolysis and reductive cleavage methods

Grant LA, Dappolonia BL//N Dakota State Univ, USDA ARS, Hard Red Spring & Durum Wheat Qual Lab, Fargo, ND 58105, USA

CEREAL CHEM 1991, 68 (6) 651

Effects of low-level gamma radiation on water-soluble nonstarchy polysaccharides isolated from hard red spring wheat flour and bran

Hosoya M, Balzarini J, Shigeta S, Declercq E\*\*//Catholic Univ Leuven, Rega Inst Med Res B-3000 Louvain, Belgium

ANTIMICROB AGENTS CHEMOTHER 1991, 35 (12) 2515

Differential inhibitory effects of sulfated polysaccharides and polymers on the replication of various myxoviruses and retroviruses, depending on the composition of the target amino acid sequences of the viral envelope glycoproteins

Jirku V//Prague Inst Chem Technol, Dept Fermentat Chem & Biogen, CS-16628 Prague 6, Czechoslovakia

BIOTECHNOL APPL BIOCHEM 1991, 14 (3) 388

Quantitative changes of wall polysaccharides in an immobilized yeast

Ma Y, Mizuno T\*, Ito H//Shizuoka Univ, Fac Agr, Oya, Shizuoka 422, Japan

AGR BIOL CHEM TOKYO 1991, 55 (1) 2701

Studies on the host-mediated antitumor polysaccharides. 15. Antitumor activity of some polysaccharides isolated from a Chinese mushroom, Huangmo, the fruiting body of *Hohenbuehelia serotina*

Nagase M, Chen RB, Araya Y, Nakajima T//Niigata Univ, Sch Dent, Dept Oral & Maxillofacial Surg 1, Gakkochi 2-5274, Niigata 951, Japan

J ORAL MAXILLOFAC SURG 1991, 49 (12) 1305

Evaluation of a bone substitute prepared from alpha-tricalcium phosphate and an acid polysaccharide solution

Shapiro ED, Berg AT, Austrian R, Schroeder D, Parcells V, Margolis A, Adair RK, Clemens JD//Yale Univ, Sch Med, Dept Pediat, 333 Cedar St, New Haven, Ct 06510, USA

N ENGL J MED 1991, 325 (21) 1453

The protective efficacy of polyvalent pneumococcal polysaccharide vaccine

Shimizu N, Tomoda M\*, Kanari M, Gonda R//Kyoritsu Coll, Pharmaceut Sci, Minato Ku, Tokyo 105, Japan

CHEM PHARM BULL TOKYO 1991, 39 (11) 2969

Acidic polysaccharide having activity on the reticuloendothelial system from the root of *Astragalus mongholicus*

Sone Y, Masaki A, Torri M//Osaka City Univ, Fac Sci Living, Dept Food & Nutr, Sugimoto cho, Sumiyoshi ku, Osaka 558, Japan

AGR BIOL CHEM TOKYO 1991, 55 (1) 2683

Immunochemical studies of exocellular polysaccharides of *Tremella* and *Cryptococcus*

Stokke BT, Elgsaeter A, Brant DA, Kitamura S//Univ Trondheim, NTH, Dept Phys & Math, Norwegian Biopolymer Lab, N-7034 Trondheim, Norway

MACROMOLECULES 1991, 24 (23) 6349

Supercoiling in circular triple-helical polysaccharides

Takeda S, Pier GB, Kojima Y, Tojo M, Muller E, Tosteson T, Goldmann DA//Harvard Univ, Childrens Hosp, Sch Med, Div Infect Dis, 300 Longwood Ave, Boston, Ma 02115, USA

CIRCULATION 1991, 84 (6) 2539

Protection against endocarditis due to *Staphylococcus epidermidis* by immunization with capsular polysaccharide/adhesin

Toba T, Uemura H, Mukai T, Fujii T, Itoh T, Adachi S//Tohoku Univ, Fac Agr, Anim Prod Chem Lab, 1-1 Tsutsumidori amamiyamachi, Aoba ku, Sendai 981, Japan

J DAIRY RES 1991, 58 (4) 497

A new fermented milk using capsular polysaccharide-producing *Lactobacillus kefirifaciens* isolated from kefir grain

Urbani R, Cesaro A\*\*//Univ Trieste, Dipartimento Biochim Biofis & Chim Macromolec, I-34127 Trieste, Italy

POLYMER 1991, 32 (16) 3013

Solvent effects on the unperturbed chain conformation of polysaccharides

Voronova YG, Rekhina NI, Nikolaeva TA, Tiunova NA, Zaikina IV, Kobzeva NY, Valiente O//All Union Marine Fisheries & Oceanogr Res Inst, Moscow 107140, Russia

J APPL PHYCOL 1991, 3 (3) 243

Extraction of carbohydrates from *Laminaria* and their utilization

## 8 LIPOPOLYSACCHARIDES

Bhat UR, Krishnaiah BS, Carlson RW\*//Univ Georgia, Complex Carbohydrate Res Ctr, 220 Riverbend Rd, Athens, Ga 30602, USA  
CARBOHYD RES 1991, 220 (NOV) 219

Re-examination of the structures of the lipopolysaccharide core oligosaccharides from *Rhizobium leguminosarum* biovar *Phaseoli*

Chu CY, Liu BK, Watson D, Szu SS, Bryla D, Shiloach J, Schneerson R, Robbins JB\*//NICHHD, Dev & Molec Immun Lab, Bethesda, Md 20892, USA

INFEC IMMUNITY 1991, 59 (12) 4450

Preparation, characterization, and immunogenicity of conjugates composed of the O-specific polysaccharide of *Shigella-dysenteriae* type-1 (*Shiga's bacillus*) bound to tetanus toxoid

Grimmecke HD, Mamat U, Lauk W, Shashkov AS, Knirel YA, Vinogradov EV, Kochetkov NK//Forschungsinst Borstel, Inst Exptl Biol & Med, Parkallee 22, W-2061 Borstel, FRG  
CARBOHYD RES 1991, 220 (NOV) 165

Structure of the capsular polysaccharide and the O-side-chain of the lipopolysaccharide from *Acetobacter methanolicus* MB-58/4 (IMET-10945), and of oligosaccharides resulting from their degradation by the bacteriophage Acml

Johnson AG, Tomai MA, Chen Y, Odean M//Univ Minnesota, Dept Med Microbiol Immunol, 10 Univ Dr, Duluth, Mn 55812, USA

J IMMUNOTHERAPY 1991, 10 (6) 398

A comparison of the immunomodulating properties of two forms of monophosphoryl lipid-A analogues

Paulsen H, Brenken M//Univ Hamburg, Inst Organ Chem, Martin Luther King Pl 6, W-2000 Hamburg 13, FRG  
LIEBIGS ANN CHEM 1991, (11) 1113

Building units of oligosaccharides. 98. Synthesis of oligosaccharides of the inner core and lipid-A region of lipopolysaccharides (German, English Abstract)

Paulsen H, Wulff A, Brenken M//Univ Hamburg, Inst Organ Chem, Martin Luther King Pl 6, W-2000 Hamburg 13, FRG  
LIEBIGS ANN CHEM 1991, (11) 1127

Building units of oligosaccharides. 99. Preparation of synthetic antigens of the inner core region of lipopolysaccharides by copolymerisation with acrylamide (German, English Abstract)

## 9 STARCH

Kalac V, Babor K, Tihlarik K//Slovak Acad Sci, Inst Chem, CS-84238 Bratislava, Czechoslovakia

CHEM PAP-CHEM ZVESTI 1991, 45 (4) 703

Structure of amylopectin. 4. The alpha-amylase dextrins and the structure of amylopectin of sorghum starch

Koizumi K, Fukuda M, Hizukuri S//Natl Inst Ind Hlth Sci, Dept Exptl Toxicol, 6-21-1 Nagao, Tama ku, Kawasaki 214, Japan  
J CHROMATOGR 1991, 585 (2) 233

Estimation of the distributions of chain length of amylopectins by high-performance liquid chromatography with pulsed amperometric detection

Gudmundsson M//Univ Lund, Dept Food Technol, Box 124, S-221 00 Lund, Sweden

CARBOHYD POLYM 1992, 17 (4) 299

Effects of an added inclusion-amylose complex on the retrogradation of some starches and amylopectin

Rao CT, Pitha J//NIA, GRC, Baltimore, Md 21224, USA

CARBOHYD RES 1991, 220 (NOV) 209

Reactivities at the O-2, O-3, and O-6 positions of cycloamyloses in Hakomori methylation

South JB, Morrison WR, Nelson OE//Allied Breweries Prod Ltd, Res & Dev Lab, 107 Stn St, Burton Trent DE14 1BZ, England  
J CEREAL SCI 1991, 14 (3) 267

A relationship between the amylose and lipid contents of starches from various mutants for amylose content in maize

Kulicke WM, Kaiser U, Schwengers D, Lemmes R//Univ Hamburg, Inst Tech & Makromolek Chem, Bundesstr 45, W-2000 Hamburg 13, FRG

STARCH 1991, 43 (10) 392

Measurements of the refractive index increment on hydroxyethyl starch as a basis for absolute molecular weight determinations

Chinnaswamy R, Hanna MA//Univ Nebraska, Dept Biol Syst Engn, Lincoln, Ne 68583, USA

STARCH 1991, 43 (10) 396

Extrusion-grafting starch onto vinyl polymers

DAIRY IND INT 1991, 56 (11) 19

Speciality starches

Gomez MH, Waniska RD, Rooney LW//Texas A&M Univ Syst, Cereal Qual Lab, College Stn, Tx 77843, USA

CEREAL CHEM 1991, 68 (6) 578

Starch characterization of nixtamalized corn flour

Harry-O'Kuru RE, Moser KB, Gordon SH//USDA, ARS, Biopolym Res Unit, Natl Ctr Agr Util Res, 1815 N Univ St, Peoria, Il 61604, USA

CARBOHYD POLYM 1992, 17 (4) 313

Colorimetric determination of the molar substitution of 2-hydroxybutyl and related starch ethers

Imberty A, Buleon A, Tran V, Perez S//INRA, Physicochim Macromol Lab, BP 527, F-44026 Nantes 03, France

STARCH 1991, 43 (10) 375

Recent advances in knowledge of starch structure

Karkalas J//Univ Strathclyde, Dept Biosci & Biotechnol, 131 Albion St, Glasgow G1 1SD, Scotland

J CEREAL SCI 1991, 14 (3) 279

Automated enzymic determination of starch by flow injection analysis

Khalil MI, Waly A, Farag S, Hebeish A//Natl Res Ctr, Div Text Res, Cairo, Egypt

J APPL POLYM SCI 1991, 43 (12) 2303

Preparation of cation-exchange starches containing phosphoric acid groups

Magel E//Tech Univ Munich, Lehrstuhl Bot & Mikrobiol, Arcisstr 21, W-8000 Munich 2, FRG

STARCH 1991, 43 (10) 384

Qualitative and quantitative determination of starch by a colorimetric method

Mita T//Osaka Womens Univ, Dept Nat Sci, Daisen cho, Osaka 590, Japan

CARBOHYD POLYM 1992, 17 (4) 269

Structure of potato starch pastes in the ageing process by the measurement of their dynamic moduli

Muhrbeck P, Eliasson AC//Univ Lund, Dept Food Technol, Box 124, S-22100 Lund, Sweden

J TEXTURE STUD 1991, 22 (3) 317

Rheological properties of protein starch mixed gels

Norby J, Jacobsen IA, Pegg DE, Starklint H, Chemnitz J, Diaper MP//Odense Univ, Inst Pathol, Nephropathol Lab, DK-5230 Odense, Denmark

TRANSPLANTATION 1991, 52 (5) 799

Preservation of rabbit kidneys using a solution containing hydrolyzed starch

Riva M, Piazza L, Schiraldi A//Univ Milan, Dipartimento Sci & Tecnol Alimentari & Microbiol, I-20133 Milan, Italy

CEREAL CHEM 1991, 68 (6) 622

Starch gelatinization in pasta cooking - Differential flux calorimetry investigations

Schulman AH, Kammiovirta K//Univ Helsinki, Inst Biotechnol, Karvaamokuja 3, SF-00380 Helsinki, Finland

STARCH 1991, 43 (10) 387

Purification of barley starch by protein extraction

Szczodrak J, Pomeranz Y//Washington State Univ, Dept Food Sci & Human Nutr, Pullman, Wa 99164, USA

CEREAL CHEM 1991, 68 (6) 589

Starch and enzyme-resistant starch from high-amylose barley

Tihlarik K, Lattova E//Slovak Acad Sci, Inst Chem, CS-84238 Bratislava, Czechoslovakia

CHEM PAP-CHEM ZVESTI 1991, 45 (4) 547

Polysaccharide sulfates. 1. Conversion of sodium sulfates of starch, carboxymethylstarch and (4-O-methyl-D-glucurono)-D-xylan into hydrogen sulfates

Wasserman BP, Timpa JD//Rutgers State Univ, Cook Coll, New Brunswick, NJ 08903, USA

STARCH 1991, 43 (10) 389

Rapid quantitative measurement of extrusion-induced starch fragmentation by automated gel permeation chromatography

## 10 STARCH-DEGRADING ENZYMES

Bajpai P, Bajpai PK\*//Univ South Calif, Ctr Appl Math Sci, Univ Pk, Los Angeles, Ca 90089, USA

APPL BIOCHEM BIOTECH 1991, 31 (2) 159

Increased production of thermostable alpha-amylase enzyme by *Bacillus* sp TCRDC-25A with maltodextrins

Hamamoto T, Horikoshi K//Riken Inst Phys & Chem Res, Japan Marine Sci & Technol Ctr, Deepstar Project, Wako, Saitama, Japan

FEMS MICROBIOL LETT 1991, 84 (1) 79

Characterisation of an amylase from a psychrotrophic *Vibrio* isolated from a deep-sea mud sample

Jamuna R, Ramakrishna SV\*//Reg Res Lab, Fermentat Sect, Trivandrum 695019, Kerala, India

ENYME MICROB TECHNOL 1992, 14 (1) 36

Continuous synthesis of thermostable alpha-amylase by *Bacillus* cells immobilized in calcium alginate

Ratnavathi CV, Ravi SB//Natl Res Ctr Sorghum, Hyderabad 500030, India

J CEREAL SCI 1991, 14 (3) 287

Effect of different durations of steeping and malting on the production of alpha-amylase in Sorghum

Yin XS, Li YX, Stark JR//Wuxi Inst Light Ind, Dept Fermentat Technol, Wuxi 214036, Peoples R China

STARCH 1991, 43 (10) 403

Amylase, beta-glucanase and protease activities from a mutant of *Bacillus subtilis*

Gottschalk N, Jaenicke R//Univ Regensburg, Inst Biophys & Phys Biochem, W-8400 Regensburg, FRG

BIOTECHNOL APPL BIOCHEM 1991, 14 (3) 324

Authenticity and reconstitution of immobilized enzymes - Characterization and denaturation renaturation of glucoamylase-II