



Bibliography of carbohydrate polymers

1 BOOKS, REVIEWS & SYMPOSIA

- Semin Arthritis Rheum* 1993 **22** (6 Suppl 1)
Special issue: Hyaluronan
- Semin Thromb Hemostasis* 1993 **19** (Suppl 1)
Special issue: Low molecular weight heparins and related polysaccharides
- Christov LP, Prior BA// Univ Orange Free State, Dept Microbiol & Biochem, POB 339, Bloemfontein 9300, South Africa
Enzyme Microb Technol 1993 **15** (6) 460
Esterases of xylan-degrading microorganisms - Production, properties, and significance (Review)
- Driouch A, Faye L, Staehelin LA// Univ Rouen, Transports Intracellulaires Lab, CNRS, URA 203, F-76134 Mont St Aignan, France
Trends Biochem Sci 1993 **18** (6) 210
The plant Golgi apparatus - A factory for complex polysaccharides and glycoproteins (TIBS review)
- Gemeiner P, Stefuca V, Bales V// Slovak Acad Sci, Inst Chem, Dubravská Cesta 9, CS-84238 Bratislava, Slovak Rep
Enzyme Microb Technol 1993 **15** (7) 551
Biochemical engineering of biocatalysts immobilized on cellulosic materials - Review
- Kobayashi H, Matsunaga K, Fujii M// Sapporo Canc Seminar Fdn, Odori Nishi 6, Chuo ku, Sapporo 060, Japan
Canc Epidem Biomarker Prev 1993 **2** (3) 271
PSK as a chemopreventive agent (Review)
- Ma L, Barbosa-Canovas GV// Washington State Univ, Dept Biol Syst Engr, Pullman, Wa 99164, USA
Rev Espan Cien Technol Aliment 1993 **33** (2) 133
Review - Rheological properties of food gums and food gum mixtures
- Rocha E, Paramo JA, Sarra J// Univ Navarra, Clin Univ, Fac Med, Serv Hematol, Apdo 192, E-31080 Pamplona, Spain
Med Clin 1993 **100** (16) 620
Heparins of low molecular weight (Review) (Spanish, English Abstract)
- Sedlarik KM// Paul Hartmann Ag, Heidenheim, FRG
Chirurgia 1993 **1** (1) 62
Alginate for wound treatment (Review) (Russian, English Abstract)

2 CELLULOSE

- Ang JF// Fiber Sales & Dev Corp, Checkerboard Sq, St Louis, Mo 63163, USA
J Amer Oil Chem Soc 1993 **70** (6) 619
Reduction of fat in fried batter coatings with powdered cellulose
- Bartov E, Ginsburg LH, Hirsh A, Ashkenazi I, Treister G// Chaim Sheba Med Ctr, Goldschleger Eye Inst, IL-52621 Tel Hashomer, Israel
Ann Ophthalmol 1993 **25** (5) 167
Methylcellulose as a contact lens irrigant when silicone oil is used in vitreoretinal surgery
- Bazus A, Rigal L, Gaset A, Fontaine T, Wieruszkeski JM, Fournet B*// *Univ Lille 1, Chim Biol Lab, CNRS Unite Mixte Rech 111, F-59655 Villeneuve Dascq, France
Carbohydr Res 1993 **243** (2) 323
Isolation and characterisation of hemicelluloses from sunflower hulls
- Beall DS, Ingram LO*// *Univ Florida, Dept Microbiol & Cell Sci, 3095 McCarty Hall, Gainesville, FL 32611, USA
J Ind Microbiol 1993 **11** (3) 151
Genetic engineering of soft-rot bacteria for ethanol production from lignocellu-

lose

- Bianchi E, Zambini EM, Masioli P// Univ Parma, Fac Sci Nat Napoli, Cattedra Chim & Tecnol Aliment, Viale Tanara 7, I-43100 Parma, Italy
Ind Aliment 1993 **32** (313) 270
Determination of carboxymethyl-cellulose as a micro-ingredient in sausages such as wurstel-salami (Italian, English Abstract)
- Bonzon V, El-Mahdi H, Rigal L, Borredon ME*// *Ecole Natl Super Chim Toulouse, Chim Aggroresources Lab, 118 Rte Narbonne, F-31077 Toulouse, France
J Chem Technol Biotechnol 1993 **57** (3) 247
Optimization of the synthesis of furanic polyols from hemicellulose hydrolyzates leading to a route to L-arabinose as a by-product
- Buchanan CM, Gedon SC, White AW, Wood MD// Eastman Chem Co, Res Labs, POB 1972, Kingsport, Tn 37662, USA
Macromolecules 1993 **26** (11) 2963
Cellulose acetate propionate and poly(tetramethylene glutarate) blends
- Burba P, Rocha JC, Schulte A// Inst Spektrochem & Angew Spekt, Postfach 101352, W-4600 Dortmund 1, FRG
Fresenius J Anal Chem 1993 **346** (4) 414
Cellulose TETRA - A chelating collector designed for multielement preconcentration in flow systems
- Chatterjee S, Sarkar S*, Bhattacharyya SN// *Saha Inst Nucl Phys, Nucl Chem, I-AF Bidhannagar, Calcutta 700064, India
Polymer 1993 **34** (9) 1979
Colloidal ferric oxide - A new photosensitizer for grafting acrylamide onto cellulose acetate films
- Chaudhuri BK, Sahai V// TUB, Inst Biotechnol, Friedrichstr 112B, O-1040 Berlin, FRG
Appl Microbiol Biotechnol 1993 **39** (2) 194
Production of cellulose using a mutant strain of *Trichoderma reesei* growing on lactose in batch culture
- Converse AO, Optekar JD// Dartmouth Coll, Thayer Sch Engr, Hannover, NH 03755, USA
Biotechnol Bioeng 1993 **42** (1) 145
A synergistic kinetics model for enzymatic cellulose hydrolysis compared to degree-of-synergism - Experimental results
- Dominguez JVH, Planas MD, Rodriguez PS, Maximino RB, Rodriguez FG// Valencia Univ, Fac Pharm, Dept Thermodynam, Avda Blasco Ibanez 13, E-46010 Valencia, Spain
Pharmazie 1993 **48** (5) 359
Modification of rheological behaviour of cellulose gels with sodium chloride concentration - Application of Ostwald's model
- Dressman JB, Adair CH, Barnett JL, Berardi RR, Dunn-Kucharski VA, Jarvenpaa KM, Parr DD, Sowle CA, Swidan SZ, Tobey SW *et al*// Univ Michigan, Coll Pharm, Ann Arbor, Mi 48109, USA
Arch Intern Med 1993 **153** (11) 1345
High molecular weight hydroxypropylmethylcellulose - A cholesterol-lowering agent
- El-Din NMS// Natl Ctr Social & Criminol Res, Cairo, Egypt
Polym Int 1993 **32** (1) 13
The water retention values of never-dried alkali-treated celluloses
- Eremeeva TE, Bykova TO// Latvian Acad Sci, Inst Wood Chem, Cellulose Lab, 27 Akademijas Str, Riga 226006, Latvia
J Chromatogr 1993 **639** (2) 159
High-performance size-exclusion chromatography of wood hemicelluloses on a poly(2-hydroxyethyl methacrylate co-ethylene dimethacrylate) column with sodium hydroxide solution as eluent
- Fukumori Y, Ichikawa H, Tokumitsu H, Miyamoto M, Jono K, Kanamori R, Akine Y, Tokita N// Kobe Gakuin Univ, Fac Pharmaceut Sci, Ikawadani cho,

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 author. When there are no publications to appear under one of these headings, that section will be omitted.

- Nishi ku, Kobe 65121, Japan
Chem Pharm Bull Tokyo 1993 41 (6) 1144
 Design and preparation of ethyl cellulose microcapsules of gadopentate dimeglumine for neutron-capture therapy using the Wurster process
- Gatenholm P, Bertilsson H, Mathiasson A// Chalmers Univ Technol, Dept Polymer Technol, S-41296 Gothenburg, Sweden
J Appl Polym Sci 1993 49 (2) 197
 The effect of chemical composition of interphase on dispersion of cellulose fibers in polymers. 1. PVC-coated cellulose in polystyrene
- Gau CS, Yu H*, Zografi G// *Nat'l Taiwan Univ, Sch Pharm, Taipei, Taiwan
Macromolecules 1993 26 (10) 2524
 Surface viscoelasticity of hydroxypropyl cellulose and hydroxyethylcellulose monolayers at the air/water interface
- Gong CS, Chen CS, Chen LF// *Purdue Univ, Dept Food Sci, Adv Bioproc Lab, West Lafayette, In 47907, USA
Appl Biochem Biotech 1993 39 83
 Pretreatment of sugar cane bagasse hemicellulose hydrolyzate for ethanol production by yeast
- Guo JH// 3M Pharmaceut, Pharm Res & Dev, 3M Ctr 270-4S-02, St Paul, Mn 55144, USA
Drug Develop Ind Pharm 1993 19 (13) 1541
 Effects of plasticizers on water permeation and mechanical properties of cellulose acetate - Antiplasticization in slightly plasticized polymer film
- Hoebergen A, Uyama Y, Okada T, Ikada Y// *Kyoto Univ, Biomed Engr Res Ctr, 53 Kawahara cho, Sakyo ku, Kyoto 606, Japan
J Appl Polym Sci 1993 48 (10) 1825
 Graft polymerization of fluorinated monomer onto corona-treated PVA and cellulose films
- Hwang FS, Hogenesch TE// *Univ Stn Calif, Loker Hydrocarbon Res Inst, Los Angeles, Ca 90089, USA
Macromolecules 1993 26 (12) 3156
 Fluorocarbon-modified water-soluble cellulose derivatives
- Ibrahim NA, Aboshosha MH// Natl Res Ctr, Div Text Res, Cairo, Egypt
J Appl Polym Sci 1993 49 (2) 291
 Novel cation-exchange composites resulting from polymerization cross-linking of acrylic acid *N*-methylolacrylamide mixtures with cellulose
- Ilyina EE, Daragan VA, Prismet AE// Univ Mainz, Inst Phys Chem, Jakob Welder Weg 15, W-6500 Mainz, FRG
Macromolecules 1993 26 (13) 3319
 Features of complexing and the solution structure from the data on rotational and translational mobility of molecular probes in cellulose acetate solutions
- Imai K, Shiomi T*, Tezuka Y, Itamochi H, Miya M// *Nagaoka Univ Technol, Dept Mat Sci & Technol, 1603-1 Kamitomioka, Nagaoka, Niigata 94021, Japan
J Appl Polym Sci 1993 48 (9) 1525
 Separability of SO₂ from SO₂/N₂ mixture through sulfoxide-modified poly(vinyl alcohol) and cellulose membranes
- Jacobson SC, Seidel-Morgenstern A, Guiochon G// *Univ Tennessee, Dept Chem, Knoxville, Tn 37996, USA
J Chromatogr 1993 637 (1) 13
 Study of band broadening in enantioselective separations using microcrystalline cellulose triacetate. 1. The linear case
- Kamide K, Miyamoto I, Okajima K// Asahi Chem Ind Co Ltd, Fundamental Res Lab Fibers & Fiber Forming Polymers, 11-7 Hachonawate, Takatsuki, Osaka 569, Japan
Polym J 1993 25 (5) 453
 Formation and properties of the lyotropic mesophase of the cellulose/mixed inorganic acid system
- Kennedy JF, Paterson M// Univ Birmingham, Dept Chem, Chem Bioact Carbohydrates & Proteins Res Lab, POB 363, Birmingham B15 2TT, England
Polym Int 1993 32 (1) 71
 Application of cellulosic fast-flow column filters to protein immobilisation and recovery
- Khare PK, Gaur MS, Bajpai A, Pandey RK, Srivastava AP// Rani Durgavati Univ, Dept Postgrad Studies & Res Phys, Jabalpur 482001, India
Indian J Pure Appl Phys 1993 31 (5) 326
 Electrical conduction in ethyl cellulose and malachite green doped polyvinyl acetate films
- Kim BJ, Lee YY*, Torget R// *Auburn Univ, Dept Chem Engr, Auburn, Al 36849, USA
Appl Biochem Biotech 1993 39 119
 An optimal temperature policy of percolation process as applied to dilute-acid hydrolysis of biphasic hemicellulose
- Kubota H, Yamaguchi T, Tanaka T// Gunma Univ, Fac Engr, Dept Chem, Kiryu, Gunma 376, Japan
Polym Degrad Stabil 1993 40 (3) 369
 Preparation of photoinitiator-bound celluloses and their reactivity
- Landin M, Martinez-Pacheco R*, Gomez-Amoza JL, Concheiro A, Rowe RC// *Univ Santiago de Compostela, Fac Farm, Dept Farmacol Farm & Tecnol Farmaceut, E-15706 Santiago de Compostela, Spain
Int J Pharm 1993 91 (2-3) 123
 Effect of country of origin on the properties of microcrystalline cellulose
- Landin M, Martinez-Pacheco R*, Gomez-Amoza JL, Souto C, Concheiro A, Rowe RC// *Univ Santiago de Compostela, Fac Farm, Dept Farmacol Farm & Tecnol Farmaceut, E-15706 Santiago de Compostela, Spain
Int J Pharm 1993 91 (2-3) 133
 Effect of batch variation and source of pulp on the properties of microcrystalline cellulose
- Landin M, Martinez-Pacheco R*, Gomez-Amoza JL, Souto C, Concheiro A, Rowe RC// *Univ Santiago de Compostela, Fac Farm, Dept Farmacol Farm & Tecnol Farmaceut, E-15706 Santiago de Compostela, Spain
Int J Pharm 1993 91 (2-3) 143
 Influence of microcrystalline cellulose source and batch variation on the tabletting behaviour and stability of prednisone formulations
- Louden JD, Duncan IA, Kelly J, Speirs RM// ICI C & P Ltd, Dept Res & Technol, Runcorn WA7 4QD, Cheshire, England
J Appl Polym Sci 1993 49 (2) 275
 The application of infrared microimaging for the determination of the distribution, penetration depth, and diffusion profile of methyl centralite and dibutyl phthalate detergents in nitrocellulose monoperforated propellant
- Luneva NK, Petushok IA, Trofimova IV, Ermolenko IN// Byelarusian Acad Sci, Inst Gen & Inorgan Chem, Minsk, Byelarus
J Appl Chem-Engl Tr 1992 65 (6) 1192
 Phosphorylation of cellulose by polyphosphoric acid
- Meluch TB, Lloyd DR// *Univ Texas, Separat Res Lab, Ctr Polymer Res, Dept Chem Engr, Austin, Tx 78712, USA
Polymer 1993 34 (9) 1984
 A comparative study of partition coefficients determined by sorption and by liquid chromatography in alcohol-water-cellulose acetate systems
- Mittal GS, Barbut S// Univ Guelph, Sch Engr, Guelph, Ontario, Canada N1G 2W1
Meat Sci 1993 35 (1) 93
 Effects of various cellulose gums on the quality parameters of low-fat breakfast sausages
- Paillet M, Cavaille JY*, Desbrieres J, Dupeyre D, Peguy A// *CNRS, CERMAV, BP 53X, F-38041 Grenoble, France
Colloid Polym Sci 1993 271 (4) 311
 Cellulose-poly(vinyl pyrrolidone) blends studied by scanning electron microscopy and dynamic mechanical measurements
- Parikh NH, Porter SC, Rohera BD// *St Johns Univ, Coll Pharm & Allied Hlth Profess, Grand Cent & Utopia Parkways, Jamaica, NY 11439, USA
Pharmaceut Res 1993 10 (6) 810
 Tensile properties of free films cast from aqueous ethylcellulose dispersions
- Podczek F, Revesz P// Univ London Sch Pharm, Dept Pharmaceut, 29-39 Brunswick Sq, London WC1N 1AX, England
Int J Pharm 1993 91 (2-3) 183
 Evaluation of the properties of microcrystalline and microfine cellulose powders
- Reeves JB, Galletti GC// USDA ARS, Beltsville Agr Res Ctr, RNL, Bldg 200, Rm 126, Beltsville, Md 20705, USA
Org Mass Spectrom 1993 28 (5) 647
 The potential of composite pyrolysis gas chromatographic mass spectra in the study of lignocellulosics
- Rowe RC, Parker MD, McKillop AG// ICI Pharmaceut plc, Alderley Pk, Macclesfield SK10 2NA, England
Int J Pharm 1993 91 (2-3) 247
 The effect of particle size on the heat of immersion of microcrystalline cellulose
- Saikia CN, Dutta NN, Borah M// Reg Res Lab, Jorhat 785006, India
Thermochim Acta 1993 219 191
 Thermal behaviour of some homogeneously esterified products of high α -cellulose pulps of fast growing plant species
- Sain MM, Kokta BV// Univ Quebec, Ctr Rech Pates & Papiers, CP 500, Trois Rivieres, Quebec, Canada G9A 5H7
J Appl Polym Sci 1993 48 (12) 2181
 Toughened thermoplastic composite. 1. Cross-linkable phenol formaldehyde and epoxy resins-coated cellulosic-filled polypropylene composites
- Sakellariou P, Hassan A, Rowe RC// ICI Paints, Res Dept, Wexham Rd, Slough SL5 2DS, England
Eur Polym J 1993 29 (7) 937
 Plasticization of aqueous poly(vinyl alcohol) and hydroxypropyl methylcellulose with polyethylene glycols and glycerol
- Savastenko GN, Yermolenko IN// Acad Sci Belarus, Inst Gen & Inorgan Chem, Minsk, Byelarus
Dokl Akad Nauk Belarusi 1993 37 (2) 157
 Colour image formation on cellulose diacetate (Russian, English Abstract)
- Seidel-Morgenstern A, Jacobson SC, Guiochon G// *Univ Tennessee, Dept Chem, Knoxville, Tn 37996, USA

J Chromatogr 1993 **637** (1) 19

Study of band broadening in enantioselective separations using microcrystalline cellulose triacetate. 2. Frontal analysis

Shukla SR, Athalye AR// Univ Bombay, Dept Chem Technol, Bombay 400019, India

J Appl Polym Sci 1993 **48** (11) 1877

Mechanical and thermal behavior of cotton cellulose graft-copolymerized using hydroxyethyl methacrylate in the presence of triethylene glycol dimethacrylate

South CR, Hogsett DA, Lynd LR*// *Dartmouth Coll, Thayer Sch Engr, Hanover, NH 03755, USA

Appl Biochem Biotech 1993 **39** 587

Continuous fermentation of cellulosic biomass to ethanol

Suvorova AI, Demchik LY, Peshekhonova AL, Sdobnikova OA// Ural State Univ, Fac Chem, 51 Lenin St, Sverdlovsk 620083, Russia

Makromol Chem-Macro Chem Phys 1993 **194** (5) 1315

Chemical structure of plasticizers, compatibility of components and phase equilibrium in plasticized cellulose diacetate

Tirkkonen S, Paronen P// Univ Kuopio, Dept Pharmaceut Technol, POB 1627, SF-70211 Kuopio, Finland

Int J Pharm 1993 **92** (1-3) 55

Release of indomethacin from tableted ethylcellulose microcapsules

Wang JY, Charlet G*// *Univ Laval, Dept Chem, Cite Univ, Quebec City, Quebec, Canada G1K 7P4

Macromolecules 1993 **26** (10) 2413

Thermodynamic study of ethylcellulose by gas chromatography

Yano K, Yoshida Y, Shinkai T, Kaneko M// Tokyo Metropolitan Res Lab Publ Hlth, 24-1 Hyakunincho 3 chome, Shinjuku ku, Tokyo 169, Japan

Water Sci Technol 1993 **27** (3-4) 295

A practical method for the concentration of viruses from water using fibriform cellulose and organic coagulant

Zhang JW, Li D, Zhang XH, Shi YQ// Tianjin Univ, Dept Chem, Tianjin 300072, Peoples Rep China

J Appl Polym Sci 1993 **49** (4) 741

Solvent effect on carboxymethylation of cellulose

3 CELLULOSE-DEGRADING ENZYMES

Abul-Naja KO, Abou-Zeid AZA*// *King Abdul-Aziz Univ, Fac Sci, Dept Biochem, POB 9028, Jeddah 21413, Saudi Arabia

Bioresource Technol 1993 **44** (3) 255

Utilization of palm-tree compound leaves in formation of cellulases

Chaudhuri BK, Sahai V// Humboldt Univ Berlin, FB LMT, Inst Biotechnol, Friedrichstr 112B, O-1040 Berlin, FRG

Enzyme Microb Technol 1993 **15** (6) 513

Production of cellulase enzyme from lactose in batch and continuous cultures by a partially constitutive strain of *Trichoderma reesei*

Girard DJ, Converse AO*// *Dartmouth Coll, Thayer Sch Engr, Hannover, NH 03755, USA

Appl Biochem Biotech 1993 **39** 521

Recovery of cellulase from lignaceous hydrolysis residue

Imam SH, Greene RV, Griffin HL// USDA ARS, Natl Ctr Agr Utilizat Res, Biopolymer Res Unit, 1815 N Univ St, Peoria, IL 61604, USA

Appl Environ Microbiol 1993 **59** (5) 1259

Binding of extracellular carboxymethylcellulase activity from the marine shipworm bacterium to insoluble cellulosic substrates

Montero GA, Kirschner TF, Tanner RD*// *Vanderbilt Univ, Dept Chem Engr, Nashville, TN 37235, USA

Appl Biochem Biotech 1993 **39** 467

Bubble and foam concentration of cellulase

Okeke BC, Obi SKC// Univ Strathclyde, Dept Biosci & Biotechnol, Royal Coll Bldg, Glasgow G1 1XW, Scotland

World J Microbiol Biotechnol 1993 **9** (3) 345

Production of cellulolytic and xylanolytic enzymes by an *Arthroglyphis* species

Olama ZA, Hamza MA, El-Sayed MM, Abdel-Fattah M// Univ Alexandria, Dept Microbiol & Bot, Alexandria, Egypt

Food Chem 1993 **47** (3) 221

Purification, properties and factors affecting the activity of *Trichoderma viride* cellulase

Rogalski J, Hatakka A, Wojtaswasilewska M, Leonowicz A// Marie Curie Skłodowska Univ, Dept Biochem, M Curie Skłodowska Pl No 3, PL-20031 Lublin, Poland

Acta Biotechnol 1993 **13** (1) 41

Cellulolytic enzymes of the ligninolytic white rot fungus *Phlebia radiata*

Rogalski J, Hatakka A, Longa B, Leonowicz A// Marie Curie Skłodowska Univ, Dept Biochem, M Curie Skłodowska Pl No 3, PL-20031 Lublin, Poland

Acta Biotechnol 1993 **13** (1) 47

Hemicellulolytic enzymes of the ligninolytic white rot fungus *Phlebia radiata* - Determination of enzyme activities

Rogalski J, Hatakka A, Longa B, Wojtaswasilewska M// Marie Curie Skłodowska Univ, Dept Biochem, M Curie Skłodowska Pl No 3, PL-20031 Lublin, Poland

Acta Biotechnol 1993 **13** (1) 53

Hemicellulolytic enzymes of the ligninolytic white rot fungus *Phlebia radiata* - Influence of phenolic compounds on the synthesis of hemicellulolytic enzymes

Singh RN, Akimenko VK// Jawaharlal Nehru Univ, Ctr Biotechnol, DST Unit Genet Engr, New Delhi 110067, India

Biochem Biophys Res Commun 1993 **192** (3) 1123

Isolation of a cellobiohydrolase of *Clostridium thermocellum* capable of degrading natural crystalline substrates

Stahlberg J, Johansson G, Pettersson G*// *Univ Uppsala, Ctr Biomed, Inst Biochem, POB 576, S-75123 Uppsala, Sweden

Biochim Biophys Acta 1993 **1157** (1) 107

Trichoderma reesei has no true exo-cellulase - All intact and truncated cellulases produce new reducing end groups on cellulose

Teunissen MJ, De Kort GVM, Den Camp HJMO, Vogels GD// Catholic Univ Nijmegen, Fac Sci, Dept Microbiol, 6525 ED Nijmegen, The Netherlands

Appl Biochem Biotech 1993 **39** 177

Production of cellulolytic and xylanolytic enzymes during growth of anaerobic fungi from ruminant and nonruminant herbivores on different substrates

4 CYCLODEXTRINS

Bicchi C, Artuffo G, D'Amato A, Manzin V, Galli A, Galli M// Univ Turin, Dipt Sci & Tecnol Farm, via Pietro Giuria 9, I-10125 Turin, Italy

J High Res Chromatogr 1993 **16** (4) 209

Cyclodextrin derivatives for the GC separation of racemic mixtures of volatile compounds. 6. The influence of the diluting phase on the enantioselectivity of 2,6-di-O-methyl-3-O-pentyl-β-cyclodextrin

Brown SE, Coates JH, Coghlan DR, Easton CJ*, Van Eyk SJ, Janowski W, Lepore A, Lincoln S, Luo Y, May BL *et al* // *Univ Adelaide, Dept Chem, GPO Box 498, Adelaide, SA 5001, Australia

Aust J Chem 1993 **46** (6) 953

Synthesis and properties of 6A-amino-6A-deoxy-α and 6A-amino-6A-deoxy-β-cyclodextrin

Chang SC, Reid GL, Chen S, Chang CD, Armstrong DW*// *Univ Missouri, Dept Chem, Rolla, Mo 65401, USA

Trend Anal Chem 1993 **12** (4) 144

Evaluation of a new polar-organic high-performance liquid chromatographic mobile phase for cyclodextrin-bonded chiral stationary phases

De Guidi G, Condorelli G, Giuffrida S, Puglisi G, Giammona G// Univ Catania, Dipt Sci Chim, Viale A Doria 8, I-95125 Catania, Italy

J Inclusion Phenom Mol Recogn 1993 **15** (1) 43

Effect of β-cyclodextrin complexation of the photohaemolytic activity induced by ketoprofen and naproxen sensitization

Encinas MV, Lissi EA, Rufs AM// Univ Santiago de Chile, Fac Ciencias, Dept Quim, Casilla 307, Correo 2, Santiago, Chile

Photochem Photobiol 1993 **57** (4) 603

Inclusion and fluorescence quenching of 2,3-dimethylnaphthalene in β-cyclodextrin cavities

Fornasier R, Scarpa E, Scrimin P*, Tecilla P, Tonellato U// *Univ Padua, Dept Organ Chem, via Marzolo 1, I-35131 Padua, Italy

J Inclusion Phenom Mol Recogn 1993 **14** (3-4) 205

A new ligand-functionalized β-cyclodextrin as an esterolytic reagent at neutral pH

Gareil P, Pernin D, Gramond JP, Guyon F// Ecole Super Phys & Chim Ind Ville Paris, Chim Analyt Lab, 10 rue Vauquelin, F-75231 Paris 05, France

J High Res Chromatogr 1993 **16** (3) 195

Free solution capillary electrophoresis as a new method for determining inclusion constants for the complexes between cyclodextrins and guest molecules

Hamada F, Fukushima M, Osa T, Ueno A// Akita Univ, Mining Coll, Dept Mat Engr & Appl Chem, Akita 010, Japan

Makromol Chem-Rap Commun 1993 **14** (5) 279

Photo-switchable hosts - Photochromism and inclusion complex formation of β-cyclodextrin bearing a spiro[2H-benzopyran-2,2'-indoline] moiety

Hamaker K, Tao BY// Purdue Univ, Dept Agr Engr, West Lafayette, IN 47907, USA

Starch 1993 **45** (5) 181

Screening of γ-cyclodextrin-producing recombinant *E. coli* using congo red dye on solid complex media

Hanawa T, Yonemochi E, Oguchi T, Nakai Y, Yamamoto K*// *Tokyo Womens Med Coll, Dept Pharmaceut, 8-1 Kawadacho, Shinjuku ku, Tokyo 162, Japan

J Inclusion Phenom Mol Recogn 1993 **15** (1) 91

Thermal behavior of ground mixtures of heptakis (2,6-di-O-methyl)-β-cyclodextrin and benzoic acid

Hartzell CJ, Mente SR, Eastman NL, Beckett JL// Nthn Arizona Univ, Dept Chem, Flagstaff, AZ 86011, USA

- J Phys Chem* 1993 **97** (19) 4887
Dynamic interaction of TCNQ- with β -cyclodextrin - A 2-dimensional NMR exchange study
- Hausler O, Muller-Goymann CC*// *Tech Univ Carolo Wilhelmina Braunschweig, Inst Pharmazeut Technol, Mendelssohnstr 1, W-3300 Braunschweig, FRG
Starch 1993 **45** (5) 183
Properties and structure of aqueous solutions of hydroxypropyl- β -cyclodextrin (German, English Abstract)
- Jung M, Schurig V// Univ Tubingen, Inst Organ Chem, Morganstelle 18, W-7400 Tubingen 1, FRG
J High Res Chromatogr 1993 **16** (4) 215
Extending the scope of enantiomer separation by capillary supercritical fluid chromatography on immobilized polysiloxane-anchored permethyl- β -cyclodextrin (Chirasil-Dex)
- Junquera E, Tardajos G, Aicart E// Univ Complutense Madrid, Fac Ciencias Quim, Dept Quim Fis 1, E-28040 Madrid, Spain
Langmuir 1993 **9** (5) 1213
Effect of the presence of β -cyclodextrin on the micellization process of sodium dodecyl sulfate or sodium perfluorooctanoate in water
- Karupiah N, Kaufman PB, Kapustka SA, Sharma A*// *Cent Michigan Univ, Dept Chem, Mt Pleasant, Mi 48859, USA
Microchem J 1993 **47** (3) 325
Use of cyclodextrin-cholesterol complex as a primary standard in cholesterol analysis
- Kohata S, Jyodai K, Ohyoshi A// Yatsushiro Natl Tech Coll, Dept Bioengn, Hirayama Shinmachi 2627, Yatsushiro, Kumamoto 866, Japan
Thermochim Acta 1993 **217** 187
Thermal decomposition of cyclodextrins (α -CyD, β -CyD, γ -CyD and modified β -CyD) and of metal (β -CyD) complexes in the solid phase
- Kralova K, Mitterhauszerova L, Devinsky F, Lacko I// Comenius Univ Bratislava, Fac Nat Sci, Inst Chem, CS-84215 Bratislava, Slovak Rep
Chem Pap-Chem Zvesti 1993 **47** (1) 51
Interactions of β -cyclodextrin with 4-alkylmorpholine *N*-oxide surfactants
- Kunitake M, Kotoo K, Manabe O, Muramatsu T, Nakashima N*// *Nagasaki Univ, Fac Engn, Dept Appl Chem, Bunkyo cho, Nagasaki 852, Japan
Chem Lett 1993 (6) 1033
Synthesis and spectral characterization of a rotaxane of β -cyclodextrin threaded by a 4,4'-diaminostilbene
- Li ZZ, Guo QX*, Ren T, Zhu XQ, Liu YC// *Lanzhou Univ, Natl Lab Appl Organ Chem, Lanzhou 730000, Peoples Rep China
J Inclusion Phenom Mol Recogn 1993 **15** (1) 37
Can TMS and DSS be used as NMR references for cyclodextrin species in aqueous solution?
- Moriya T, Saito K, Kurita H, Matsumoto K, Otake T, Mori H, Morimoto M, Ueba N, Kunita N// Tanabe Seiyaku Co Ltd, Appl Biochem Res Lab, Osaka 532, Japan
J Med Chem 1993 **36** (11) 1674
A new candidate for an anti-HIV-1 agent - Modified cyclodextrin sulfate (mCDS71)
- Ndou T, Mukundan S, Warner IM*// *Louisiana State Univ, Dept Chem, Baton Rouge, La 70803, USA
J Inclusion Phenom Mol Recogn 1993 **15** (1) 9
Complexation of ephedrine with β -cyclodextrin - An NMR spectroscopy study
- Pikramenou Z, Johnson KM, Nocera DG*// *Michigan State Univ, Dept Chem, East Lansing, Mi 48824, USA
Tetrahedron Lett 1993 **34** (22) 3531
Synthesis of a cradle cyclodextrin
- Sakairi N, Utsuki T, Kuzuhara H// Inst Phys & Chem Res, Wako, Saitama 35101, Japan
Biosci Biotechnol Biochem 1993 **57** (5) 850
Facile synthesis of 6'-O-(α -D-galactopyranosyl)cyclomaltohepatose from commercially available branched cyclodextrin
- Sanemasa I, Wu Y, Koide Y, Shigenaga M, Ishibashi K, Deguchi T// Kumamoto Univ, Fac Sci, Dept Chem, Kurokami 2-39-1, Kumamoto 860, Japan
Bull Chem Soc Jpn 1993 **66** (5) 1424
Preparation of cyclodextrin precipitates with volatile hydrocarbons in aqueous media, and determination of hydrocarbon cyclodextrin molar ratios in the precipitates
- Shortreed ME, Wylie RS, Macartney DH*// *Queens Univ, Dept Chem, Kingston, Ontario, Canada K7L 3N6
Inorg Chem 1993 **32** (9) 1824
Inclusion of (*N*-adamantan-1'-ylpyrazinium)pentacyanoferrate(III) ion in α -cyclodextrins and β -cyclodextrins - Effects of inclusion on the spectroscopic properties and ligand substitution kinetics
- Suzuki I, Chen QA, Ueno A, Osa T*// *Tohoku Univ, Inst Pharmaceut, Aoba ku, Sendai, Miyagi 980, Japan
Bull Chem Soc Jpn 1993 **66** (5) 1472
Ferrocene-appended cyclodextrins - The effects of temperature, organic solvent, length of spacer, and cavity size on the complexation behavior
- Suzuki M, Ito K, Fushimi C, Kondo T// Sankyo Co Ltd, Prod Dev Labs, Hiromachi, Shinagawa ku, Tokyo 140, Japan
Chem Pharm Bull Tokyo 1993 **41** (5) 942
A study cyclodextrin complex formation by a freezing point depression method
- Tamura M, Sekiya A*// *Natl Inst Mat & Chem Res, 1-1 Higashi, Tsukuba, Ibaraki 305, Japan
Bull Chem Soc Jpn 1993 **66** (5) 1356
The thin film of a fluorine-containing polymer with cyclodextrin prepared by the Langmuir-Blodgett technique and its application to photochromic thin films
- Tanimoto T, Sakaki T, Koizumi K// Mukogawa Womens Univ, Fac Pharmaceut Sci, 11-68 Koshien Kyuban cho, Nishinomiya, Hyogo 663, Japan
Chem Pharm Bull Tokyo 1993 **41** (5) 866
Preparation of di-*O*-triphenylmethyl-(trityl)cyclomalto-octaoses, and isolation and characterization by hex-5-enose degradation of 4 positional isomers
- Tawarah KM// Yarmouk Univ, Dept Chem, Irbid, Jordan
J Inclusion Phenom Mol Recogn 1993 **14** (3-4) 195
A thermodynamic study of the inclusion processes of α -cyclodextrins and β -cyclodextrins with the acid forms of methyl orange and methyl yellow
- Tawarah KM, Wazwaz AA// Yarmouk Univ, Dept Chem, Irbid, Jordan
J Chem Soc Faraday Trans 1993 **89** (11) 1729
Conductance study of the binding of methyl orange, *o*-methyl red and *p*-methyl red anions by α -cyclodextrin in water
- Tran V, Delage MM, Buleon A// INRA Nantes, Physicochim Macromolec Lab, rue de la Geraudiere, BP 527, F-44026 Nantes 03, France
J Inclusion Phenom Mol Recogn 1993 **14** (3-4) 271
A systematic docking approach - Application to the α -cyclodextrin phenylethanol complex
- Xu WY, Demas JN*, De Graff BA, Whaley M// *Univ Virginia, Dept Chem, Charlottesville, Va 22901, USA
J Phys Chem 1993 **97** (24) 6546
Interactions of pyrene with cyclodextrins and polymeric cyclodextrins
- Yamamura H, Nagaoka H, Saito K, Kawai M, Butsugan Y, Nakajima T, Fujita K// Nagoya Inst Technol, Dept Appl Chem, Showa ku, Nagoya, Aichi 466, Japan
J Org Chem 1993 **58** (11) 2936
Determination of the structures of tris(6-*O*-mesitylenesulfonyl)- α -cyclodextrin regioisomers by ^1H NMR analyses of the corresponding 3,6-anhydrocyclodextrin derivatives
- Yamashoji Y, Fujiwara M, Matsushita T*, Tanaka M// *Osaka Univ, Fac Engn, Dept Appl Chem, Suita, Osaka 565, Japan
Chem Lett 1993 (6) 1029
Evaluation of association between cyclodextrins and various inorganic anions in aqueous solutions by ^81Br NMR spectroscopy

5 LIGNIN

- Akim LG, Shevchenko SM, Zarubin MY// Forest Tech Acad, Dept Organ Chem, St Petersburg 194018, Russia
Wood Sci Technol 1993 **27** (4) 241
 ^{13}C NMR studies on lignins depolymerized with dry hydrogen iodide
- Asther M, Meunier JC*// *INRA, CBAI, Inst Natl Agronom, Ctr Grignon, Chim Biol Lab, F-78850 Thiverval Grignon, France
Appl Biochem Biotech 1993 **38** (1-2) 57
Immobilization as a tool for the stabilization of lignin peroxidase produced by *Phanerochaete chrysosporium* INA-12
- Becker EG, Sinitsyn AP// Moscow MV Lomonosov State Univ, Sch Chem, Moscow, Russia
Biochemistry-Engl Trans 1992 **57** (10) 1049
Choice of purification procedures for ligninolytic enzymes
- Brunow G, Karlsson O, Lindquist K, Sipilä J// Univ Helsinki, Dept Chem, Vuorikatu 20, SF-00100 Helsinki, Finland
Wood Sci Technol 1993 **27** (4) 281
On the distribution of the diastereomers of the structural elements in lignins - The steric course of reactions mimicking lignin biosynthesis
- Dosoretz CG, Rothschild N, Hadar Y// Technion Israel Inst Technol, Dept Environm Engn & Water Resources, IL-32000 Haifa, Israel
Appl Environ Microbiol 1993 **59** (6) 1919
Overproduction of lignin peroxidase by *Phanerochaete chrysosporium* (BKM-F-1767) under nonlimiting nutrient conditions
- El-Saied H, Nada AAMA// Natl Res Ctr, Dept Cellulose & Paper, Cairo, Egypt
Polym Degrad Stab 1993 **40** (3) 417
The thermal behaviour of lignins from wasted black pulping liquors
- Hammel KE, Jensen KA, Mozuch MD, Landucci LL, Tien M, Pease EA// US Forest Serv, Forest Prod Lab, Madison, Wi 53705, USA
J Biol Chem 1993 **268** (17) 12274
Ligninolysis by a purified lignin peroxidase
- Hartig C, Lorbeer H// Umweltforschungszentrum Leipzig Halle GmbH, Sekt Umweltmikrobiol, Permoserstr 15, O-7050 Leipzig, FRG
Acta Biotechnol 1993 **13** (1) 31

Phenomenological principles of microbial lignin degradation

- Hofmann K, Glasser WG// Virginia Tech, Dept Wood Sci & Forest Prod, Blacksburg, Va 24061, USA
J Adhes 1993 **40** (2-4) 229
 Engineering plastics from lignin. 22. Cure of lignin based epoxy resins
- Hu ZC, Korus RA*, Venkataramu CR, Crawford RL// *Univ Idaho, Ctr Hazardous Waste Remediat Res, Dept Chem Engr, Moscow, Id 83843, USA
Enzyme Microb Technol 1993 **15** (7) 567
 Deactivation kinetics of lignin peroxidase from *Phanerochaete chrysosporium*
- Kotelnikova NE, Shashilov AA, Hou YF// Russian Acad Sci, Inst Macromolec Cpds, Bolshoi Pr 31, St Petersburg 199004, Russia
Wood Sci Technol 1993 **27** (4) 263
 Effect of the presence of lignin on the structure and reactivity to hydrolysis of lignin-carbohydrate complexes of poplar wood obtained by sulfate pulping
- Moukha SM, Wosten HAB, Asther M, Wessels JGH// INRA, Fac Sci Luminy, Biotechnol Champignons Filamenteux Lab, Parc Sci & Technol, 163 Ave Luminy, F-13288 Luminy 09, France
J Gen Microbiol 1993 **139** (5) 969
In situ localization of the secretion of lignin peroxidases in colonies of *Phanerochaete chrysosporium* using a sandwiched mode of culture
- Peng W, Reidl B*, Barry AO// *Univ Laval, Fac Foresterie & Geomat, Dept Sci Bois, Ctr Rech Sci & Ingn Macromolec, St Foy, Quebec, Canada G1K 7P4
J Appl Polym Sci 1993 **48** (10) 1757
 Study of the kinetics of lignin methylation
- Perez J, Jeffries TW*// *US Forest Serv, Forest Prod Lab, Inst Microbial & Biochem Technol, 1 Gifford Pinchot Dr, Madison, Wi 53705, USA
Appl Biochem Biotech 1993 **39** 227
 Role of organic acid chelators in manganese regulation of lignin degradation by *Phanerochaete chrysosporium*
- Ruttimann-Johnson C, Salas L, Vicuna R*, Kirk TK// *Catholic Univ Chile, Fac Ciencias Biol, Bioquim Lab, Casilla 114-D, Santiago, Chile
Appl Environ Microbiol 1993 **59** (6) 1792
 Extracellular enzyme production and synthetic lignin mineralization by *Cerriopsis subvermispora*

6 POLYSACCHARIDES - NAMED

- Clin Pharmacy* 1993 **12** (7) 471
 Low-molecular-weight heparin to be marketed (News)
- Arguelles-Monal W, Peniche-Covas C*// *Univ Havana, IMRE, Havana 10400, Cuba
Angew Makromol Chem 1993 **207** 1
 Preparation and characterization of a mercaptan derivative of chitosan for the removal of mercury from brines
- Arranz F, Sanchez-Chaves M, Ramirez JC// Inst Ciencia & Tecnol Polimeros, Juan de La Cierva 3, E-28006 Madrid, Spain
Polymer 1993 **34** (9) 1908
 Kinetic aspects of the reaction of succinylated dextran with glycidyl acetate
- Autenshlyus AI, Brusentsov NA, Lockshin A// RAMS, Inst Clin & Exptl Med, 2 Timakova St, Novosibirsk 630117, Russia
J Magn Magn Mater 1993 **122** (1-3) 360
 Magnetic-sensitive dextran-ferrite immunosorbents (for diagnosis and therapy)
- Baracat-Pereira MC, Vanetti MCD, De Araujo EF, Silva DO*// *Univ Fed Vicosa, Dept Microbiol, BR-36570 Vicosa, MG, Brazil
J Ind Microbiol 1993 **11** (3) 139
 Partial characterization of *Aspergillus fumigatus* polygalacturonases for the degumming of natural fibers
- Barbakadze VV, Kemertelidze EP, Dekanosidze HE, Usov AI// IG Kutateladze Pharmacochem Inst, Tbilisi, Rep Georgia
Bioorg Khim 1993 **19** (2) 223
 Structure of a galactoglucan from unripe fruits of *Tamus communis* L (Dioscoreaceae) (Russian, English Abstract)
- Barker PE, Ganetsos G, Ajongwen NJ// Univ Aston, Dept Chem Engr & Appl Chem, Birmingham B4 7ET, England
J Chem Technol Biotechnol 1993 **57** (1) 21
 A novel approach to the production of clinical-grade dextran
- Belleville MP, Williams P, Brillouet JM*// *INRA, Inst Prod Vigne, Polymeres & Techn Phys Chim Lab, 2 Pl Viala, F-34060 Montpellier 1, France
Phytochemistry 1993 **33** (1) 227
 A linear arabinan from red wine
- Bordi F, Cametti C*, Paradossi G// *Univ Roma La Sapienza, Dipt Fis, I-00185 Rome, Italy
Macromolecules 1993 **26** (13) 3363
 High-frequency dielectric relaxation measurements of side-chain dynamics of branched chitosan derivatives in aqueous solutions
- Camelin I, Lacroix C*, Paquin C, Prevost H, Cachon R, Divies C// *Univ Laval, Fac Sci Agr & Alimentat, Ctr Rech Stela, St Foy, Quebec, Canada G1K 7P4
Biotechnol Progr 1993 **9** (3) 291
 Effect of chelators on gellan gel rheological properties and setting temperature for immobilization of living bifidobacteria
- Carriere CJ, Amis EJ, Schrag JL, Ferry JD// Dow Chem Co USA, Cent Res, ME Pruitt Res Ctr, Bldg 1702, Midland, Mi 48674, USA
J Rheol 1993 **37** (3) 469
 Dilute solution dynamic viscoelastic properties of xanthan polysaccharide
- Chambert R, Petit-Glatron MF// Inst Jacques Monod, CNRS, 2 Pl Jussieu, F-75251 Paris, France
Carbohydr Res 1993 **244** (1) 129
 Immobilisation of levansucrase on calcium phosphate gel strongly increases its polymerase activity
- Chiessi E, Paradossi G, Venanzi M, Pispisa B*// *Univ Roma Tor Vergata, Dipt Sci & Tecnol Chim, I-00173 Rome, Italy
Int J Biol Macromol 1993 **15** (3) 145
 Association complexes between Fe(III) or Cu(II) ions and chitosan derivatives - A thermodynamic and spectroscopic investigation
- Cleemput G, Roels SP, Van Oort M, Grobet PJ, Delcour JA// TNO, Utrechtseweg 48, 3705 AJ Zeist, The Netherlands
Cereal Chem 1993 **70** (3) 324
 Heterogeneity in the structure of water-soluble arabinoxylans in European wheat flours of variable bread-making quality
- Coughlan MP, Hazlewood GP*// *AFRC, Inst Anim Physiol & Genet Res, Dept Cellular Physiol, Cambridge CB2 4AT, England
Biotechnol Appl Biochem 1993 **17** (3) 259
 β -1,4-D-xylan-degrading enzyme systems - Biochemistry, molecular biology and applications
- Curotto E, Aros F// Univ Catolica Valparaiso, Fac Ciencias Basicas & Matemat, Inst Quim, Casilla 4059, Valparaiso, Chile
Anal Biochem 1993 **211** (2) 240
 Quantitative determination of chitosan and the percentage of free amino groups
- Desbrieres J, Borsali R*, Rinaudo M, Milas M// *CERMAV, CNRS, POB 53X, F-38041 Grenoble, France
Macromolecules 1993 **26** (10) 2592
 χ F interaction parameter and single chain diffusion coefficients of dextran/poly(vinylpyrrolidone) water - Dynamic light scattering experiments
- Dey PM, Patel S, Brownleader MD// Univ London Royal Holloway & Bedford New Coll, Dept Biochem, Egham Hill, Egham TW20 0EX, Surrey, England
Biotechnol Appl Biochem 1993 **17** (3) 361
 Induction of α -galactosidase in *Penicillium ochrochloran* by guar (*Cyamopsis tetragonoloba*) gum
- Doco T, Brillouet JM// INRA, Inst Prod Vigne, Polymeres & Tech Physicochim Lab, 2 Pl Viala, F-34060 Montpellier, France
Carbohydr Res 1993 **243** (2) 333
 Isolation and characterisation of a rhamnogalacturonan II from red wine
- Dongowski G// Deutsch Inst Ernährungsforsch Potsdam Rehbrücke, Arthur Scheunert Allee 114-116, O-1505 Bergholz Rehbrücke, FRG
Starch 1993 **45** (5) 166
 Investigations on potato pulp as a dietary fiber source - The influence of pectolytic and cellulolytic enzymes (German, English Abstract)
- Ershov BG, Seliverstov AF, Sukhov NL, Bykov GL// Russian Acad Sci, Inst Phys Chem, Moscow 119715, Russia
Bull Russ Acad Sci Div Chem Sci-Engl Tr 1992 **41** (10) 1805
 Sorption of Cu²⁺ ions by chitin and chitosan from aqueous solutions - Molecular structure of complexes formed
- Fayyaz A, Asbi BA, Ghazali HM, Man YBC, Jinap S// Univ Pertanian Malaysia, Fac Food Sci & Biotechnol, Serdang 43400, Malaysia
Food Chem 1993 **47** (2) 183
 Pectinesterase extraction from papaya
- Filho EXF, Puls J, Coughlan MP*// *Natl Univ Ireland, Univ Coll Galway, Dept Biochem, Galway, Ireland
Enzyme Microb Technol 1993 **15** (6) 535
 Physicochemical and catalytic properties of a low molecular weight endo-1,4- β -D-xylanase from *Myrothecium verrucaria*
- Filho EXF, Puls J, Coughlan MP*// *Natl Univ Ireland, Univ Coll Galway, Dept Biochem, Galway, Rep Ireland
J Ind Microbiol 1993 **11** (3) 171
 Biochemical characteristics of 2 endo- β -1,4-xylanases produced by *Penicillium capsulatum*
- Fishman ML, Levaj B, Gillespie D, Scorza R// USDA ARS, Eastern Reg Res Ctr, 600 E Mermaid Lane, Philadelphia, Pa 19118, USA
J Amer Soc Hort Sci 1993 **118** (3) 343
 Changes in the physico-chemical properties of peach fruit pectin during on-tree ripening and storage
- Fujii T, Hisanaka T, Ogoma Y, Kondo Y// Shinshu Univ, Fac Text Sci & Technol, 3-15-1 Tokida, Ueda, Nagano 386, Japan
Biol Pharm Bull 1993 **16** (6) 544
 Interaction of a protein-bound polysaccharide (PSK) with chicken gizzard caldesmon

- Geitel B, Ryl W, Fiedler B// Humboldt Univ Berlin, Lehrstuhl Mikrobiol, FB Lebensmitteltechnol, Warschauer Str 43-44, O-1017 Berlin, FRG
Zbl Mikrobiol 1993 **148** (3) 205
 Microbial hydrolysis of inulin-containing juice from Jerusalem artichoke to fructose-syrup
- Gonzalez RD, Arenas EC, Vilches EB, Debillerbeck MA// Natl Univ Cordoba, Fac Ciencias Exactas & Nat, Velez Sarsfield 299, RA-5000 Cordoba, Argentina
Biotechnol Technique 1993 **7** (6) 429
 Selective procedure for isolation of microorganisms producing pullulanase and isoamylase
- Gore RS, Miller KJ// *Penn State Univ, Grad Program Genet, Univ Pk, Pa 16802, USA
Plant Physiol 1993 **102** (1) 191
 Cyclic β -1,6 -1,3 glucans are synthesized by *Bradyrhizobium japonicum* bacteroids within soybean (*Glycine max*) root nodules
- Guibal E, Saucedo I, Roussy J, Roulph C, Lecloirec P// Ecole Mines Ales, Enstima, Ctr Environnement Ind, Genie Environnement Lab, 6 Ave Clavieres, F-30319 Ales, France
Water SA 1993 **19** (2) 119
 Uranium sorption by glutamate glucan - A modified chitosan. 2. Kinetic studies
- Gu KN, Liu J, Pervin A, Lindhart RJ// *Univ Iowa, Coll Pharm, Div Med & Nat Prod Chem, Iowa City, Ia 52242, USA
Carbohydr Res 1993 **244** (2) 369
 Comparison of the activity of 2 chondroitin AC lyases on dermatan sulfate
- Hisano T, Nishimura M, Yonemoto Y, Abe S, Yamashita T, Sakaguchi K, Kimura A, Murata K// *Kyoto Univ, Food Sci Res, Uji, Kyoto 611, Japan
J Ferment Bioeng 1993 **75** (5) 332
 Bacterial alginate lyase highly active on acetylated alginates
- Huber DJ, O'Donoghue EM// Univ Florida, Dept Hort Sci, Gainesville, Fl 32611, USA
Plant Physiol 1993 **102** (2) 473
 Polyuronides in avocado (*Persea americana*) and tomato (*Lycopersicon esculentum*) fruits exhibit markedly different patterns of molecular weight downshifts during ripening
- Khasin A, Alchanati I, Shoham Y// *Technion Israel Inst Technol, Dept Food Engn & Biotechnol, IL-32000 Haifa, Israel
Appl Environ Microbiol 1993 **59** (6) 1725
 Purification and characterization of a thermostable xylanase from *Bacillus stearothermophilus* T-6
- Khomutov LI, Sheenson VA, Lashek NA, Pitchkina NM// Saratov Univ, Chem Res Inst, Saratov, Russia
Colloid J Russ Acad Sci-Engl Trans 1992 **54** (5) 786
 Kinetics of cross-linking of aqueous solutions of pectin
- Khoo KH, Morris HR, McDowell RA, Dell A*, Maccarana M, Lindahl U// *Univ London Imperial Coll Sci Technol & Med, Dept Biochem, London SW7 2AZ, England
Carbohydr Res 1993 **244** (2) 205
 FABMS derivatization strategies for the analysis of heparin-derived oligosaccharides
- Kim JH, Lee YM// *Hanyang Univ, Coll Engr, Dept Ind Chem, Seungdong ku, Seoul 133791, South Korea
Polymer 1993 **34** (9) 1952
 Synthesis and properties of diethylaminoethyl chitosan
- Konishi Y, Asai S, Midoh Y, Oku M// Univ Osaka Prefecture, Dept Chem Engr, 1-1 Gakuen cho, Sakai, Osaka 593, Japan
Separ Sci Technol 1993 **28** (9) 1691
 Recovery of zinc, cadmium, and lanthanum by biopolymer gel particles of alginic acid
- Kroger G, Busch-Stockfisch M*, Wilhelmi F// *Fachhsch Hamburg, Fachbereich Ernährung & Hauswirtschaft, Lohbrügge Kirchstr 65, W-2050 Hamburg 80, FRG
Z Lebensmittel-Untersuch Fors 1993 **196** (6) 540
 The thermal stability of guar gums in dependence of granule size (German, English Abstract)
- Lasko CL, Pesic BM, Oliver DJ// Humboldt State Univ, Dept Chem, Arcata, Ca 95521, USA
J Appl Polym Sci 1993 **48** (9) 1565
 Enhancement of the metal-binding properties of chitosan through synthetic addition of sulfur-containing and nitrogen-containing compounds
- Leal JA, Prieto A, Gomez-Miranda B, Jimenez-Barbero J, Bernabe M// CSIC, Ctr Invest Biol, Velazquez 144, E-28006 Madrid, Spain
Carbohydr Res 1993 **244** (2) 361
 Structure and conformational features of an alkali-soluble and water-soluble galactofuranan from the cell walls of *Eupenicillium crustaceum*
- Lerouge P, O'Neill MA, Darvill AG, Albersheim P// *Univ Georgia, Complex Carbohydrate Res Ctr, 220 Riverbend Rd, Athens, Ga 30602, USA
Carbohydr Res 1993 **243** (2) 359
 Structural characterization of endo-glycanase-generated oligoglycosyl side chains of rhamnogalacturonan I
- Lerouge P, O'Neill MA, Darvill AG, Albersheim P// *Univ Georgia, Complex Carbohydrate Res Ctr, 220 Riverbend Rd, Athens, Ga 30602, USA
Carbohydr Res 1993 **243** (2) 373
 The purification of commercially available endo- α -L-arabinanases and α -L-arabinosidase for use in the structural analysis of pectic polysaccharides
- Lin FG, Marinsky JA// *SUNY, Dept Chem, Buffalo, NY 14214, USA
React Polym 1993 **19** (1-2) 27
 A Gibbs-Donnan-based interpretation of the effect of medium counterion concentration levels on the acid dissociation properties of alginic acid and chondroitin sulfate
- Marconi W, Barontini P, Martinelli A, Piozzi A// Univ Roma La Sapienza, Dept Chem, I-00185 Rome, Italy
Makromol Chem-Macro Chem Phys 1993 **194** (5) 1347
 New polyurethane compositions containing high amounts of covalently bonded heparin
- Martinez-Salazar JM, Palacios AN, Sanchez R, Caro AD, Soberon-Chavez G// *Univ Nacl Autonoma Mexico, Inst Biotechnol, Dept Bioingn, Apdo Postal 510-3, Cuernavaca 62271, Morelos, Mexico
Mol Microbiol 1993 **8** (6) 1053
 Genetic stability and xanthan gum production in *Xanthomonas campestris* pv *campestris* NRRL B1459
- Mazurkiewicz J, Zaleska H, Zaplotny J// Hugo Kollataj Acad Agr, Dept Chem & Phys, Al Mickiewicza 21, PL-31120 Krakow, Poland
Starch 1993 **45** (5) 175
 Studies in carbohydrate based glues and thickeners for foodstuffs. 1. Glucose-sucrose-apple pectin ternary system (German, English Abstract)
- McLeod AD, Friend DR, Tozer TN// *Univ Calif San Francisco, Sch Pharm, Dept Pharm, Box 0446, San Francisco, Ca 94143, USA
Int J Pharm 1993 **92** (1-3) 105
 Synthesis and chemical stability of glucocorticoid-dextran esters - Potential prodrugs for colon-specific delivery
- Miller SS, Vincent DJ, Weisz J, Fulcher RG// Univ Ottawa, Dept Biochem, Ottawa, Ontario, Canada K1N 6N5
Can J Plant Sci 1993 **73** (2) 429
 Oat β -glucans - An evaluation of Eastern Canadian cultivars and unregistered lines
- Molina O, Fitzsimons R, Perotti N// UNT, Fac Ciencias Exactas & Tecnol, Catedra Microbiol Ind, Avda Belgrano & Pje Caseros, RA-4000 Tucuman, Argentina
Biotechnol Lett 1993 **15** (5) 495
 Effect of corn steep liquor on xanthan production by *Xanthomonas campestris*
- Nagahashi G, Doner L, Abney G, Tsao A// USDA ARS, Eastern Reg Res Ctr, 600 E Mermaid Lane, Philadelphia, Pa 19118, USA
Biotechnol Technique 1993 **7** (6) 467
 The low temperature, rapid dissolution of gellan away from root cultures
- Neau SH, Goskonda SR, Upadrashta SM, Thies CA, Tripp SI// Univ Missouri, Sch Pharm, 5005 Rockhill Rd, Kansas City, Mo 64110, USA
Amer J Pharm Educ 1993 **57** (2) 126
 Encapsulation of a volatile oil by ionic gelation of alginate
- Nerdal W, Haugen F, Knutsen S, Grasdalen H// *Norwegian Inst Technol, Marine Biochem Lab, Div Biotechnol, N-7034 Trondheim, Norway
J Biomol Struct Dyn 1993 **10** (5) 785
 Evidence for double helical κ -carrageenan in aqueous LiI-solution and model for iodide binding
- Nordmeier E// Platanenallee 9, W-4515 Bad Essen 1, FRG
J Phys Chem 1993 **97** (21) 5770
 Static and dynamic light-scattering solution behavior of pullulan and dextran in comparison
- Nosedá MD, Cerezo AS// *Univ Buenos Aires, Fac Ciencias Exactas & Nat, Dept Quim Organ, Pabellon 2, Ciudad Univ, RA-1428, Buenos Aires, Argentina
Int J Biol Macromol 1993 **15** (3) 177
 Room temperature, low-field ^{13}C -NMR spectra of degraded carrageenans. 3. Autohydrolysis of a λ -carrageenan and of its alkali-treated derivative
- Ogawa K, Oka K, Yui T// Univ Osaka Prefecture, Adv Sci & Technol Res Inst, 1-2 Gakuen cho, Sakai, Osaka 593, Japan
Chem Mater 1993 **5** (5) 726
 X-ray study of chitosan transition metal complexes
- Pancheva SN// Bulgarian Acad Sci, Inst Microbiol, BU-1113 Sofia, Bulgaria
Antivir Chem Chemother 1993 **4** (3) 189
 Antiherpes effect of dextran sulphate combined with acyclovir *in vitro* and *in vivo*
- Pifferi PG, Spagna G, Rincon RN, Setti L// Univ Bologna, Dept Ind Chem & Mat, Viale del Risorgimento 4, I-40136 Bologna, Italy
Biotechnol Technique 1993 **7** (6) 457
 A new method for immobilization of pectic enzymes
- Ponder GR, Richards GN// *Univ Montana, Wood Chem Lab, Missoula, Mt 59812, USA
Carbohydr Res 1993 **244** (1) 27

- Mechanisms of pyrolysis of polysaccharide. 7. Pyrolysis of some ^{13}C -labeled glucans - A mechanistic study
Ponder GR, Richards GN*// *Univ Montana, Wood Chem Lab, Missoula, Mt 59812, USA
Carbohydr Res 1993 **244** (2) 341
- Mechanisms of pyrolysis of polysaccharides. 8. Pyrolysis of inulin, glucose, and fructose
Priem B, Gitti R, Bush CA, Gross KC*// *USDA ARS, Beltsville Agr Res Ctr, Hort Crops Qual Lab, Bldg 002, Beltsville, Md 20705, USA
Plant Physiol 1993 **102** (2) 445
- Structure of 10 free *N*-glycans in ripening tomato fruit - Arabinose is a constituent of a plant *N*-glycan
Qin Y// Scottish Coll Text, Dept Technol, Galashiels TD1 3HF, Scotland
J Appl Polym Sci 1993 **49** (4) 727
- The chelating properties of chitosan fibers
Raoul Y// Address not available.
Bull Acad Natl Med 1992 **176** (9) 1557
- Use of an endoglucanase-pentosanase complex produced by *Humicola insolens* in production of beer and bread (French, English Abstract)
Renard CMGC, Thibault JF// INRA, Ctr Rech Agroalimentaires, Biochim & Technol Glucides Lab, rue Geraudiere, BP 527, F-44026 Nantes, France
Carbohydr Res 1993 **244** (1) 99
- Structure and properties of apple and sugar-beet pectins extracted by chelating agents
Sami AJ, Akhtar MW// Univ London, Royal Free Hosp, Sch Med, Dept Biochem, London NW3 2PF, England
Enzyme Microb Technol 1993 **15** (7) 586
- Purification and characterization of 2 low molecular weight endoglucanases of *Cellulomonas flavigena*
Sasaki H, Schmitt D, Hayashi Y, Pollard RB, Suzuki F*// *Univ Texas, Med Branch, Dept Internal Med H82, Galveston, Tx 77550, USA
Nat Immun 1993 **12** (2) 104
- Antitumor mechanisms of Z-100, an immunomodulatory arabinomannan extracted from *Mycobacterium tuberculosis* - The importance of lymphocytes infiltrated into tumor sites
Saucedo I, Guibal E*, Roussy J, Roulph C, Lecloirec P// *Ecole Mines Ales, ENSTIMA, Ctr Environnement Ind, Genie Environnement Lab, 6 Ave Clavieres, F-30319 Ales, France
Water SA 1993 **19** (2) 113
- Uranium sorption by glutamate glucan - A modified chitosan. 1. Equilibrium studies
Savalgi V, Savalgi V// Univ Agr Sci Dharwar, Dept Agr Microbiol, Dharwar 580005, Karnataka, India
J Gen Appl Microbiol Tokyo 1992 **38** (6) 641
- Alginate production by *Azotobacter vinelandii* in batch culture
Schuster R, Wenzig E, Mersmann A// Tech Univ Munich, Dept Chem Engn B, Arcisstr 21, W-8000 Munich 2, FRG
Appl Microbiol Biotechnol 1993 **39** (2) 155
- Production of the fungal exopolysaccharide pullulan by batch-wise and continuous fermentation
Simon L, Caye-Vaugien C, Bouchonneau M// Univ Nantes, Fac Sci & Tech, Biol Vegetale & Biotechnol Lab, 2 rue Houssinnee, F-44072 Nantes 03, France
J Gen Microbiol 1993 **139** (5) 979
- Relation between pullulan production, morphological state and growth conditions in *Aureobasidium pullulans* - New observations
Singh JS, Taylor KG, Doyle RJ*// *Univ Louisville, Acad Hlth Ctr, Louisville, Ky 40292, USA
Carbohydr Res 1993 **244** (1) 137
- Essential amino acids involved in glucan-dependent aggregation of *Streptococcus sobrinus*
Storr-Paulsen A// Cent Hosp, Dept Ophthalmol, DK-4300 Holbaek, Denmark
Acta Ophthalmol 1993 **71** (2) 173
- Analysis of the short-term effect of two viscoelastic agents on the intraocular pressure after extracapsular cataract extraction - Sodium hyaluronate 1% vs hydroxypropyl methylcellulose 2%
Tanaka S, Aketagawa J, Takahashi S, Shibata Y, Tsumuraya Y, Hashimoto Y*// *Saitama Univ, Fac Sci, Dept Biochem, 225 Shimo Ohkubo, Urawa, Saitama 338, Japan
Carbohydr Res 1993 **244** (1) 115
- Inhibition of high molecular weight (1 $\rightarrow$ 3)- β -D-glucan-dependent activation of a *Limulus* coagulation factor G by laminaran oligosaccharides and curdlan degradation products
Tenkanen M, Puls J, Ratto M, Viikari L// VTT, Biotech Lab, Box 202, SF-02151 Espoo, Finland
Appl Microbiol Biotechnol 1993 **39** (2) 159
- Enzymatic deacetylation of galactoglucomannans
Vandenbossche GMR, Remon JP*// *State Univ Ghent, Pharmaceut Technol Lab, Harelbekestr 72, B-9000 Ghent, Belgium
J Pharm Pharmacol 1993 **45** (5) 484
- Influence of the sterilization process on alginate dispersions
Vandenbossche GMR, Van Oostveldt P, Demeester J, Remon JP*// *State Univ Ghent, Pharmaceut Technol Lab, Harelbekestr 72, B-9000 Ghent, Belgium
Biotechnol Bioeng 1993 **42** (3) 381
- The molecular weight cut-off of microcapsules is determined by the reaction between alginate and polylysine
Van Hamel S, Cleemput G, Delcour JA, Nys M, Darius PL// Katholieke Univ Leuven, Food Chem Res Inst, Kardinaal Mercierlaan 92, B-3001 Heverlee, Belgium
Cereal Chem 1993 **70** (3) 306
- Physicochemical and functional properties of rye nonstarch polysaccharides. 4. The effect of high molecular weight water-soluble pentosans on wheat-bread quality in a straight-dough procedure
Van Sommeren APG, Machielsen PAGM, Gribnau TCJ// Organon Teknika BV, Akzo Pharma Div, Clin Lab Syst Res Unit, POB 84, 5280 AB Bostel, The Netherlands
J Chromatogr 1993 **639** (1) 23
- Comparison of 3 activated agaroses for use in affinity chromatography - Effects on coupling performance and ligand leakage
Venisse A, Berjeaud JM, Chaurand P, Gilleron M, Puzo G*// *CNRS, Dept Glycoconjugates & Biomembranes, Pharmacol & Toxicol Lab, F-31062 Toulouse, France
J Biol Chem 1993 **268** (17) 12401
- Structural features of lipoarabinomannan from *Mycobacterium bovis* BCG - Determination of molecular mass by laser desorption mass spectrometry
Vinkx CJA, Reynaert HR, Grobet PJ, Delcour JA// Catholic Univ Leuven, Fac Landbouwwetenschappen, B-3030 Heverlee, Belgium
Cereal Chem 1993 **70** (3) 311
- Physicochemical and functional properties of rye nonstarch polysaccharides. 5. Variability in the structure of water-soluble arabinoxylans
Vyas P, Deshpande MV*// *Natl Chem Lab, Div Biochem Sci, Poona 411008, India
J Gen Appl Microbiol Tokyo 1993 **39** (1) 91
- Purification and characterization of an endochitinase from *Myrothecium verrucaria*
Yang ZB, Tsuchiya Y*, Arika T, Hosokawa M// *Kaken Pharmaceut Co Ltd, Cent Res Labs, 14 Shinomiya Minami Kawara cho, Yamashina ku, Kyoto 607, Japan
Jpn J Cancer Res 1993 **84** (5) 538
- Inhibitory effects of sizofiran on anticancer agent-induced or X-ray-induced sister chromatid exchanges and mitotic block in murine bone marrow cells
Yokota A, Kondo K, Nakagawa M, Kojima I, Tomita F// Hokkaido Univ, Fac Agr, Dept Biosci & Chem, Appl Microbiol Lab, Kita 9, Nishi 9, Kita ku, Sapporo, Hokkaido 060, Japan
Biosci Biotechnol Biochem 1993 **57** (5) 745
- Production of levanbiose by a levan-degrading enzyme from *Streptomyces exfoliatus* F3-2
Yuan S, Szakalas-Gratzl G, Ziats NP, Jacobsen DW, Kottke-Marchant K, Marchant RE*// *Case Western Reserve Univ, Dept Biomed Engr, Cleveland, Oh 44106, USA
J Biomed Mater Res 1993 **27** (6) 811
- Immobilization of high-affinity heparin oligosaccharides to radiofrequency plasma-modified polyethylene
Yui N, Nihira J, Okano T, Sakurai Y// Japan Adv Inst Sci & Technol, 15 Asahidai, Tatsunokuchi, Ishikawa 92312, Japan
J Control Release 1993 **25** (1-2) 133
- Regulated release of drug microspheres from inflammation responsive degradable matrices of crosslinked hyaluronic acid
Zhao WW, Zhong XG, Yu L, Zhang YF, Sun JZ// Chinese Acad Sci, Changchun Inst Appl Chem, Changchun 130022, Peoples Rep China
Polym Degrad Stabil 1993 **41** (1) 83
- Some chemical changes in chitosan induced by γ -ray irradiation
Zinoun M, Cosson J, Deslandes E// Univ Caen, Esplanade Paix, Biol & Biotechnol Marines Phycol Lab, F-14032 Caen, France
Bot Mar 1993 **36** (2) 131
- Influence of culture conditions on growth and physicochemical properties of carrageenans in *Gigartina teedii* (Rhodophyceae, Gigartinales)

7 POLYSACCHARIDES - OTHER

Formation of supermolecular structures of polysaccharide-surfactant complexes in aqueous solutions - Influence of the polymer backbone

Auzanneau FI, Bundle DR// *Nat'l Res Council Canada, Inst Biol Sci, Ottawa, Ontario, Canada K1A 0R6

Can J Chem 1993 71 (4) 534

Application of thioglycoside chemistry in the synthesis of trisaccharides and deoxy-trisaccharides related to the *Shigella flexneri* Y polysaccharide

Beutler JA, McKee TC, Fuller RW, Tischler M, Cardellina JH, Snader KM, McCloud TG, Boyd MR// *NCI, Drug Discovery Res & Dev Lab, Bldg 1052, Rm 121, Frederick, Md 21702, USA

Antivir Chem Chemother 1993 4 (3) 167

Frequent occurrence of HIV-inhibitory sulphated polysaccharides in marine invertebrates

Blinkovsky AM, Dordick JS// *Univ Iowa, Dept Chem & Biochem Engr, Iowa City, Ia 52242, USA

Tetrahedron-Asymmetry 1993 4 (6) 1221

Enzymatic derivatization of saccharides and their chemical polymerization

Bourgougnon N, Lahaye M, Chermann JC, Kornprobst JM// *ISOMER, Grp SMAB, Fac Pharm, 1 rue G Veil, F-44035 Nantes 01, France

Bioorg Medicinal Chem Letter 1993 3 (6) 1141

Composition and antiviral activities of a sulfated polysaccharide from *Schizymenia dubyi* (Rhodophyta, Gigartinales)

Cescutti P, Ravenscroft N, Ng S, Lam Z, Dutton GGS// Univ Trieste, Dipt Biochim Biofis & Chim Macromolec, via L Giorgieri 1, I-34127 Trieste, Italy

Carbohydr Res 1993 244 (2) 325

Structural investigation of the capsular polysaccharide produced by a novel *Klebsiella* serotype (SK1) - Location of O-acetyl substituents using NMR and MS techniques

De Pinto GL, Nava M, Martinez M, Rivas C// Univ Zulia, Fac Humanidades & Educ, Invest Quim Lab, Apartado 526, Maracaibo, Venezuela

Biochem Syst Ecol 1993 21 (4) 463

Gum polysaccharides of 9 specimens of *Laguncularia racemosa*

Fedorova GA, Ivko AA, Bondarenko NT, Shapatyi VA// Byelarussian Acad Sci, Inst Phys Organ Chem, Minsk, Russia

High Energy Chem-Engl Tr 1992 26 (6) 391

Effect of structure and adsorbed water on the radiolysis of polysaccharides. 2. Role of water in the formation of gaseous products

Felix G, Zhang T// ENSCPB, Chim Organ & Organometall Lab, CNRS, URA 35, 351 Cours Liberat, F-33405 Talence, France

J Chromatogr 1993 639 (2) 141

Chiral packing materials for high-performance liquid chromatographic resolution of enantiomers based on substituted branched polysaccharides coated on silica gel

Frosch M, Muller A// Hannover Med Sch, Inst Med Mikrobial, W-3000 Hannover 61, FRG

Mol Microbiol 1993 8 (3) 483

Phospholipid substitution of capsular polysaccharides and mechanisms of capsule formation in *Neisseria meningitidis*

Gorshkova RP, Nazarenko EL, Zubkov VA, Ivanova EP, Ovodov YS, Shashkov AS, Knirel YA// Russian Acad Sci, Pacific Inst Bioorgan Chem, Vladivostok, Russia

Bioorg Khim 1993 19 (3) 327

Structure in the repeating unit of the acidic polysaccharide from *Aalteromonas haloplanktis* KMM 156

Guarro J, Cano J, Leal JA, Gomez-Miranda B, Bernabe M// Univ Rovira & Virgili, Fac Med, Unitat Microbiol, EA-43201 Reus, Spain

Mycopathologia 1993 122 (2) 69

Composition of the cell wall polysaccharides in some geophilic dermatophytes

Hashiguchi Y, Seri S, Kubomura K, Abe Y, Kamimura K, Fujimoto C, Iguchi T, Iwai K// Nihon Mediphs Co Ltd, 3-1 Kitasode, Sodegaura 29902, Japan

Nippon Kagaku Kaishi 1993 (5) 521

Study on gadolinium complexes based on polysaccharide derivatives as a contrast agent for MRI

Kobayashi K, Kakishita N, Okada M, Akaike T, Kitazawa S// Nagoya Univ, Fac Agr, Chikusa ku, Nagoya 46401, Japan

Makromol Chem-Rap Commun 1993 14 (5) 293

Synthesis of amphiphilic graft copolymers having clustered glucosides via homopolymerization of a macromonomer obtained from 2-methacryloyloxyethyl α -D-glucopyranoside

Koeman FAW, Kamertling JP, Vliegthart JFG// *Univ Utrecht, Bijvoet Ctr, Dept Bio-Organ Chem, POB 80075, 3508 TB Utrecht, The Netherlands

Tetrahedron 1993 49 (24) 5291

Synthesis of structural elements of the capsular polysaccharide of *Streptococcus pneumoniae* type 8

Kulakowska M, Brisson JR, Griffith DW, Young NM, Jennings HJ// *Nat'l Res Council Canada, Inst Biol Sci, Ottawa, Ontario, Canada K1A 0R6

Can J Chem 1993 71 (5) 644

High-resolution NMR spectroscopic analysis of the C-polysaccharide of *Streptococcus pneumoniae*

Morin A, Moresoli C, Rodrigue N, Dumont J, Racine M, Poitras E// Agr Canada, Ctr Food Res & Dev, 3600 Casavant Blvd W, St Hyacinthe, Quebec, Canada J2S 8E3

Enzyme Microb Technol 1993 15 (6) 500

Effect of carbon, nitrogen, and agitation on exopolysaccharide production by *Enterobacter agglomerans* grown on low grade maple sap

Nicolaus B, Manca MC, Romano I, Lama L// CNR, Ist Chim Molec Interesse Biol, via Toiano 6, I-80072 Arco, Italy

FEMS Microbiol Lett 1993 109 (2-3) 203

Production of an exopolysaccharide from 2 thermophilic archaea belonging to the genus *Sulfolobus*

Nyman M, Nylander T, Asp NG// Lund Univ, Ctr Chem, Dept Appl Nutr & Food Chem, POB 124, S-22100 Lund, Sweden

Food Chem 1993 47 (2) 169

Degradation of water-soluble fibre polysaccharide in carrots after different types of processing

Pollock TJ, Yamazaki M// Shin Etsu Bio Inc, 6650 Lusk Blvd, Ste B106, San Diego, Ca 92121, USA

J Ind Microbiol 1993 11 (3) 187

Clarification of microbial polysaccharides with enzymes secreted from *Lyso-bacter* species

Reuhs BL, Carlson RW, Kim JS// Univ Georgia, Complex Carbohydrate Res Ctr, 220 Riverbend Rd, Athens, Ga 30602, USA

J Bacteriol 1993 175 (11) 3570

Rhizobium fredii and *Rhizobium meliloti* produce 3-deoxy-D-manno-2-octulosonic acid-containing polysaccharides that are structurally analogous to group II K antigens (capsular polysaccharides) found in *Escherichia coli*

Robertson JT, Meric AL, Dohan FC, Schweitzer JB, Wujek JR, Ahmad S// Univ Tennessee Ctr Hlth Sci, Dept Neurosurg, 847 Monroe Ave, Ste 427, Memphis, Tn 38163, USA

J Neurosurg 1993 79 (1) 89

The reduction of postlaminectomy peridural fibrosis in rabbits by a carbohydrate polymer

Saulnier L, Mestres C, Doublier JL, Roger P, Thibault JF// INRA Biochim & Technol Glucides Lab, BP 527, F-44026 Nantes, France

J Cereal Sci 1993 17 (3) 267

Studies of polysaccharides solubilized during alkaline cooking of maize kernels

Shashkov AS, Malysheva VA, Naumova IB, Streshinskaya GM, Evtushenko LI// ND Zelinskii Inst Organ Chem, Moscow, Russia

Bioorg Khim 1993 19 (4) 433

Poly(ribofuranosylribitol phosphate) in cell wall of *Agromyces cerinus* subsp *nitratus* Vkm AC-1351 (Russian, English Abstract)

Sinniger V, Tapon-Bretaudiere J, Millien C, Muller D, Jozefonvicz J, Fischer AM// *Hop Necker Enfants Malad, Hematol Lab, 149 rue Sevres, Tour Pasteur, F-75743 Paris 15, France

J Chromatogr-Biomed Appl 1993 615 (2) 215

Affinity chromatography of sulphated polysaccharides separately fractionated on antithrombin III and heparin cofactor II immobilized on concanavalin A-sepharose

Uhrin D, Brisson JR, Bundle DR// Slovak Acad Sci, Inst Chem, CS-80936 Bratislava, Slovak Rep

J Biomol NMR 1993 3 (3) 367

Pseudo-3D NMR spectroscopy - Application of oligosaccharide and polysaccharides

Utkina NS, Elisheva GI, Nikolaev AV, Shibaev VN// ND Zelinskii Inst Organ Chem, Moscow, Russia

Bioorg Khim 1993 19 (2) 228

Fragments of biopolymers containing glycosyl phosphate residues. 12. The synthesis of glycosyl phosphosugars containing 2-acetamido-2-deoxy- α -D-mannopyranosyl phosphate residues including a fragment of the capsular antigen from *Neisseria meningitidis* A (Russian, English Abstract)

Wang HB, Zheng QY, Qian DH, Fang J, Ju DW// Mil Med Coll 2, Coll Pharm, Dept Pharmacol, Shanghai 200433, People Rep China

Acta Pharmacol Sin 1993 14 (3) 243

Effects of *Phytolacca acinosa* polysaccharides I on immune function in mice

Zhao WS, Zhang YQ, Ren LJ, Zhang L, Yang J// China Japan Friendship Inst Clin Med Sci, Dept Immunol, Beijing 100029, Peoples Rep China

Acta Pharmacol Sin 1993 14 (3) 273

Immunopotentiating effects of polysaccharides isolated from *Medicago sativa* L

Zubkov VA, Nazarenko EL, Botvinko IV// Russian Acad Sci, Pacific Inst Bioorgan Chem, Vladivostok, Russia

Bioorg Khim 1993 19 (4) 427

Structure of the repeating unit of the extracellular polysaccharide from *Mycobacterium convolutum* 240 (Russian, English Abstract)

8 LIPOPOLYSACCHARIDES

Alving CR// Walter Reed Army Inst Res, Dept Membrane Biochem, Washing-

- ton, DC 20307, USA
Immunobiology 1993 **187** (3-5) 430
 Lipopolysaccharide, lipid A, and liposomes containing lipid A as immunologic adjuvants
- Aspinall GO, McDonald AG, Raju TS, Pang H, Moran AP, Penner JL// York Univ, Dept Chem, 4700 Keele St, Nth York, Ontario, Canada M3J 1P3
Eur J Biochem 1993 **213** (3) 1017
 Chemical structures of the core regions of *Campylobacter jejuni* serotypes O:1, O:4, O:23, and O:36 lipopolysaccharides
- Aspinall GO, McDonald AG, Raju TS, Pang H, Kurjanczyk LA, Penner JL, Moran AP// York Univ, Dept Chem, 4700 Keele St, North York, Ontario, Canada M3J 1P3
Eur J Biochem 1993 **213** (3) 1029
 Chemical structure of the core region of *Campylobacter jejuni* serotype O:2 lipopolysaccharide
- Bhattacharyya T, Basu S*// Indian Assoc Cultivat Sci, Dept Biol Chem, Calcutta 700032, West Bengal, India
Indian J Chem Sect-B 1993 **32** (6) 700
 Structural studies on the hexose region of *Escherichia coli* O-126 core antigen
- Eidhin DN, Mouton C*// *Univ Laval, Fac Med Dent, Rech Ecol Buccale Grp, Quebec City, Quebec, Canada G1K 7P4
FEMS Microbiol Lett 1993 **110** (2) 133
 A rapid method for preparation of rough and smooth lipopolysaccharide from *Bacteroides*, *Porphyromonas* and *Prevotella*
- Gamian A, Romanowska E*, Dabrowski U, Dabrowski J// *Ludwik Hirsfeld Inst Immunol & Exptl Therapy, Ulica Czerska 12, PL-53114 Wroclaw, Poland
Eur J Biochem 1993 **213** (3) 1255
 Structure of the O-specific polysaccharide containing pentitol phosphate, isolated from *Hafnia alvei* strain PCM 1191 lipopolysaccharide
- Gass J, Strobl M, Loibner A, Kosma P*, Zahringer U// *Agr Univ Vienna, Inst Chem, A-1180 Vienna, Austria
Carbohyd Res 1993 **244** (1) 69
 Synthesis of allyl O-[sodium(α -D-glycero-D-talo-2-octulopyranosyl)onate]-(2 $\rightarrow$ 6)-2-acetamido-2-deoxy- β -D-glucopyranoside, a core constituent of the lipopolysaccharide from *Acinetobacter calcoaceticus* NCTC 10305
- Hozbor D, Rodriguez ME, Samo A, Lagares A, Yantorno O// UNLP, Ctr Invest & Desarrollo Fermentaciones Ind, Calle 47-Y-115, RA-1900 La Plata, Argentina
Res Microbiol 1993 **144** (3) 201
 Release of lipopolysaccharide during *Bordetella pertussis* growth
- Kato N// Nagoya Univ, Sch Med, Dept Bacteriol, 65 Tsurumai cho, Showa ku, Nagoya, Aichi 466, Japan
Micron 1993 **24** (1) 91
 Crystallization and electron microscopy of bacterial lipopolysaccharide (LPS)
- Kogan G, Haraguchi G, Hull SI, Hull RA, Shashkov AS, Jann B, Jann K*// *Max Planck Inst Immunobiol, Stubeweg 51, W-7800 Freiburg, FRG
Eur J Biochem 1993 **214** (1) 259
 Structural analysis of O4-reactive polysaccharides from recombinant *Escherichia coli* - Changes in the O-specific polysaccharide induced by cloning of the rfb genes
- Kondo S, Ishida K, Isshiki Y, Haishima Y, Iguchi T, Hisatsune K*// *Josai Univ, Sch Pharmaceut Sci, Dept Microbiol, Sakado, Saitama 35002, Japan
Biochem J 1993 **292** (2) 531
 N-3-hydroxypropionyl- α -D-perosamine homopolymer constituting the O-chain of lipopolysaccharides from *Vibrio* bioserogroup 1875 possessing antigenic factor(s) in common with O1 *Vibrio cholera*
- Lightfoot J, Lam JS*// *Univ Guelph, Dept Microbiol, Guelph, Ontario, Canada N1G 2W1
Mol Microbiol 1993 **8** (4) 771
 Chromosomal mapping, expression and synthesis of lipopolysaccharide in *Pseudomonas aeruginosa* - A role for guanosine diphospho (GDP)-D-mannose
- Okamura N, Chida T, Kinoshita M, Yoshida Y, Kondo S, Hisatsune K// Tokyo Med & Dent Univ, Sch Allied Hlth Sci, Dept Clin Microbiol & Immunol, 1-5-45 Yushima, Tokyo 113, Japan
Microbiol Immunol 1993 **37** (4) 331
 Chemical analysis of lipopolysaccharides of *Shigella sonnei* form II strains expressed by cloned form I antigen genes
- Paulsen H, Hoffgen EC// Univ Hamburg, Inst Organ Chem, Martin Luther King Pl 6, W-2000 Hamburg 13, FRG
Liebigs Ann Chem 1993 (5) 531
 Building units of oligosaccharides. 105. Synthesis of the pentasaccharide L- α -D-Hep-(1 $\rightarrow$ 3)-L- α -D-Hep-(1 $\rightarrow$ 5)- α -Kdo(2 $\rightarrow$ 6)- β -D-GlcNhm(1 $\rightarrow$ 6)-D-GlcNhm of the linear core and lipid A structure of lipopolysaccharides (German, English Abstract)
- Paulsen H, Hoffgen EC// Univ Hamburg, Inst Organ Chem, Martin Luther King Pl 6, W-2000 Hamburg 13, FRG
Liebigs Ann Chem 1993 (5) 543
 Building units of oligosaccharides. 106. Preparation of synthetic antigens composed of DL-heptose-containing trisaccharides of the core region of lipopolysaccharides by copolymerization with acrylamide (German, English Abstract)
- Pozsgay V, Glaudemans CPJ, Robbins JB, Schneerson R// NICHD, Dev & Molec Immun Lab, Bethesda, Md 20892, USA
Carbohyd Res 1993 **244** (2) 259
 Synthesis of a tetrasaccharide donor corresponding to the O-specific polysaccharide of *Shigella dysenteriae* type 1
- Rietschel ET, Kirikae T, Schade FU, Ulmer AJ, Holst O, Brade H, Schmidt G, Mamat U, Grimmecke HD, Kusumoto S *et al*// Forschungsinst Borstel, Inst Exptl Biol & Med, Parkallee 22, W-2061 Borstel, FRG
Immunobiology 1993 **187** (3-5) 169
 The chemical structure of bacterial endotoxin in relation to bioactivity
- Seydel U, Labischinski H, Kastowsky M, Brandenburg K// Forschungsinst Borstel, Parkallee 10, W-2061 Borstel, FRG
Immunobiology 1993 **187** (3-5) 191
 Phase behaviour, supramolecular structure, and molecular conformation of lipopolysaccharide
- Weintraub A, Leontein K, Widmalm G, Vial PA, Levine MM, Lindberg AA// Huddinge Hosp, Karolinska Inst, Dept Clin Bacteriol, S-14186 Huddinge, Sweden
Eur J Biochem 1993 **213** (2) 859
 Structural studies of the O-antigenic polysaccharide of an enteroaggregative *Escherichia coli* strain
- Zahringer U, Sinnwell V, Peter-Katalinic J, Rietschel ET, Galanos C// Forschungsinst Borstel, W-2061 Borstel, FRG
Tetrahedron 1993 **49** (20) 4193
 Isolation and characterization of the tetrasaccharide (bis)phosphate from the glycosyl backbone of *Salmonella minnesota* and *Escherichia coli* re-mutant lipopolysaccharides

9 STARCH

- Abraham TE// Reg Res Lab, Fermentat Sect, Trivandrum 659019, India
Starch 1993 **45** (4) 131
 Stabilization of paste viscosity of cassava starch by heat moisture treatment
- Biliaderis CG, Mazza G, Przybylski R// Univ Manitoba, Dept Food Sci, Winnipeg, Manitoba, Canada R3T 2N2
Starch 1993 **45** (4) 121
 Composition and physico-chemical properties of starch from cow cockle (*Saponaria vaccaria* L.) seeds
- Boldt J, Knothe C, Schindler E, Hammermann H, Dapper F, Hemplemann G// Justus Liebig Univ Giessen, Dept Anaesthesiol & Intens Care Med, Klinikstr 29, W-6300 Giessen, FRG
Brit J Anaesth 1993 **70** (6) 661
 Volume replacement with hydroxyethyl starch solution in children
- Breslin VT, Li BE// SUNY, Marine Sci Res Ctr, Inst Waste Management, Stony Brook, NY 11794, USA
J Appl Polym Sci 1993 **48** (12) 2063
 Weathering of starch polyethylene composite films in the marine environment
- Cameron RE, Donald AM// Univ Cambridge, Cavendish Lab, Madingley Rd, Cambridge CB3 0HE, England
Carbohyd Res 1993 **244** (2) 225
 A small-angle X-ray scattering study of the absorption of water into the starch granule
- Degling L, Stjarnkvist P, Sjöholm I*// *Med Prod Agcy, Div Pharm, Box 26, S-75103 Uppsala, Sweden
Pharmaceut Res 1993 **10** (6) 783
 Biodegradable microspheres. 15. Interferon- γ in starch microparticles - Nitric oxide-generating activity *in vitro* and antileishmanial effect in mice
- Desai DS, Rubitski BA, Varia SA, Newman AW// Bristol Myers Squibb Co, POB 191, New Brunswick, NJ 08903, USA
Int J Pharm 1993 **91** (2-3) 217
 Physical interactions of magnesium stearate with starch-derived disintegrants and their effects on capsule and tablet dissolution
- Eerlingen RC, Crombez M, Delcour JA// Catholic Univ Leuven, Food Chem Res Unit, B-3030 Heverlee, Belgium
Cereal Chem 1993 **70** (3) 339
 Enzyme-resistant starch. 1. Quantitative and qualitative influence of incubation time and temperature of autoclaved starch on resistant starch formation
- Eerlingen RC, Deceuninck M, Delcour JA// Catholic Univ Leuven, Food Chem Res Unit, B-3030 Heverlee, Belgium
Cereal Chem 1993 **70** (3) 345
 Enzyme-resistant starch. 2. Influence of amylose chain length on resistant starch formation
- Haase NU// Bundesanstalt Getreide Kartoffel & Fettforschung Detmold & Munster, W-4930 Detmold, FRG
Agribiol Res 1993 **46** (1) 20
 Studies on potato starch quality in relation to tuber classification (German, English Abstract)
- Inglett GE// USDA ARS, Natl Ctr Agr Utilizat Res, Biopolymer Res Unit, 1815 N Univ St, Peoria, IL 61604, USA

- Food Chem* 1993 **47** (2) 133
Amylodextrins containing β -glucan from oat flours and bran
Jane JL// Iowa State Univ Sci & Technol, Dept Food Sci & Human Nutr, Ames, Ia 50011, USA
Starch 1993 **45** (5) 161
Mechanism of starch gelatinization in neutral salt solutions
Jane JL// Iowa State Univ Sci & Technol, Dept Food Sci & Human Nutr, Ames, Ia 50011, USA
Starch 1993 **45** (5) 172
 ^{13}C -NMR study of interactions between amylopectin and neutral salts (German, English Abstract)
Kim CH, Rhee SK// Korea Inst Sci & Technol, Genet Engr Res Inst, POB 17, Taedok Sci Town, Taejon 305606, South Korea
Process Biochem 1993 **28** (5) 331
Process development for simultaneous starch saccharification and ethanol fermentation by *Zymomonas mobilis*
Konik CM, Miskelly DM, Gras PW// Bread Res Inst Australia Inc, POB 7, Nth Ryde, NSW 2113, Australia
Starch 1993 **45** (4) 139
Starch swelling power, grain hardness and protein - Relationship to sensory properties of Japanese noodles
Lim JK, Hayashi N, Matsuo H, Hayakawa I, Fujio Y*// *Kyushu Univ 4609, Fac Agr, Food Technol Lab, Fukuoka 812, Japan
J Fac Agr Kyushu Univ 1993 **37** (3-4) 307
Plasticization of wheat starch gluten mixture under an elevated temperature
Matsumoto S, Mitsumori K, Taniguchi M, Takano K, Kamoi I// Tokyo Univ Agr & Technol, Ctr Food Proc, 1-1-1 Sakuragaoka, Setagaya ku, Tokyo 156, Japan
J Jpn Soc Food Sci Technol 1993 **40** (4) 262
Changes of some properties of kiwifruit starch during post-harvest ripening
Morgan KR, Furneaux RH, Stanley RA// Address not available.
Carbohydr Res 1993 **243** (2) C9
Observation by solid-state ^{13}C CP MAS NMR spectroscopy of the transformations of wheat starch associated with the making and staling of bread (*Carbohydr Res* 1993, **235** 15) (Correction)
Ohya C, Kawabata A// Tokyo Univ Agr & Technol, Fac Agr, Dept Nutr, 1-1-1 Sakuragaoka, Setagaya ku, Tokyo 156, Japan
J Jpn Soc Food Sci Technol 1993 **40** (4) 225
The structure and gelatinization properties of rice starch prepared from different varieties - (Studies on physical and chemical properties and taste characteristics of rice. 2.) (Japanese, English Abstract)
Patel BK, Sinha VK, Patel CP, Trivedi HC*// *Sardar Patel Univ, Dept Chem, Vallabh Vidyanagar 388120, Gujarat, India
Starch 1993 **45** (5) 178
Graft copolymerization of acrylonitrile onto sodium salt of partially carboxymethylated starch using Ce^{4+} -amine system as redox initiator (German, English Abstract)
Pirselova K, Smogrovicova D, Balaz S// Slovak Polytech Univ, Fac Chem Technol, Dept Biochem Technol, Radlinskeho 9, CS-81237 Bratislava, Slovak Rep
World J Microbiol Biotechnol 1993 **9** (3) 338
Fermentation of starch to ethanol by a co-culture of *Saccharomycopsis fibuligera* and *Saccharomyces cerevisiae*
Reddy OVS, Basappa SC// Cent Food Technol Res Inst, Mysore 570013, Karnataka, India
Starch 1993 **45** (5) 187
Selection and characterization of *Endomycopsis fibuligera* strains for one-step fermentation of starch to ethanol (German, English Abstract)
Sarmidi MR, Barker PE*// *Aston Univ, Dept Chem Engr & Appl Chem, Aston Triangle, Birmingham B4 7ET, England
J Chem Technol Biotechnol 1993 **57** (3) 229
Saccharification of modified starch to maltose in a continuous rotating annular chromatograph (CRAC)
Sievert D, Wursch P// Nestle Res Ctr, Vers Chez Bland, CH-1000 Lausanne 26, Switzerland
Cereal Chem 1993 **70** (3) 333
Thermal behavior of potato amylose and enzyme-resistant starch from maize
Sievert D, Holm J// Nestle Res Ctr, Dept Food Sci, POB 44, CH-1000 Lausanne 26, Switzerland
Starch 1993 **45** (4) 136
Determination of amylose by differential scanning calorimetry
Sokhey AS, Chinnaswamy R*// *Midwest Grain Prod Inc, Atchison, Ks 66002, USA
Cereal Chem 1993 **70** (3) 260
Chemical and molecular properties of irradiated starch extrudates
Soni PL, Sharma H, Gharia MM// Forest Res Inst, Div MFP, Chem Forest Prod Lab, Dehra Dun 248006, India
Starch 1993 **45** (4) 127
Physicochemical properties of *Quercus leucotrichophora* (oak) starch
Subramanian S, Laskowski JS*// *Univ British Columbia, Dept Mining & Mineral Proc Engr, Vancouver, Brit Columbia, Canada V6T 1W5
Langmuir 1993 **9** (5) 1330
Adsorption of dextrin onto graphite
Trimmell D, Swanson CL, Shogren RL, Fanta GF*// *Natl Ctr Agr Utilizat Res, Plant Polymer Res, 1815 N Univ St, Peoria, Il 61604, USA
J Appl Polym Sci 1993 **48** (9) 1665
Extrusion processing of granular starch-G-poly(methyl acrylate) - Effect of extrusion conditions on morphology and properties
Vennat B, Gross D, Pourrat A*, Pourrat H// *Fac Pharm Clermont Ferrand, Pharm Galen & Pharmacotech Lab, 28 Pl Henri Dunant, F-63001 Clermont Ferrand, France
Drug Develop Ind Pharm 1993 **19** (11) 1357
Tablets of *Hamamelis* dry extract by direct compression - Comparative study of natural starches and starch derivatives
Yamashita S, Baba N, Moriyama H// Fukuoka Agr Res Ctr, 587 Yoshiki, Chikushino Shi, Fukuoka 818, Japan
J Jpn Soc Food Sci Technol 1993 **40** (5) 365
Application of dual-wavelength spectrophotometry to determination of amylose and amylopectin content (Japanese, English Abstract)
Yun SH, Matheson NK*// *Univ Sydney, Dept Agr Chem, Sydney, NSW 2006, Australia
Carbohydr Res 1993 **243** (2) 307
Structures of the amylopectins of waxy, normal, amylose-extender, and wx-ae genotypes and of the phytylglycogen of maize
Ziegler GR, Thompson DB, Casasnovas J// Penn State Univ, Dept Food Sci, Univ Pk, Pa 16802, USA
Cereal Chem 1993 **70** (3) 247
Dynamic measurement of starch granule swelling during gelatinization

10 STARCH-DEGRADING ENZYMES

- Fogarty WM, Collins BS, Doyle EM, Kelly CT*// *Natl Univ Ireland, Univ Coll Dublin, Dept Ind Microbiol, Dublin 4, Rep Ireland
J Ind Microbiol 1993 **11** (3) 199
The high maltose-forming α -amylase of *Saccharomyces viridis* - Mechanisms of action
Freer SN// USDA ARS, Natl Ctr Agr Utilizat Res, Fermentat Biochem Res Unit, Peoria, Il 61604, USA
Appl Environ Microbiol 1993 **59** (5) 1398
Purification and characterization of the extracellular α -amylase from *Streptococcus bovis* JB1
German A// Address not available.
Bull Acad Natl Med 1992 **176** (9) 1553
Authorization requested to use BSG amylase from a recombinant strain of *Bacillus licheniformis* with expression of a *Bacillus stearothermophilus* gene (French, English Abstract)
German A// Address not available.
Bull Acad Natl Med 1992 **176** (9) 1555
Authorization requested to use a maltogenic exo- α -amylase produced by a recombinant strain of *Bacillus subtilis* (French, English Abstract)
Kikuchi S, Shibayama J, Yasui M, Takeuchi T, Yamamoto I, Sato M// Muroran Inst Technol, Dept Appl Microbiol, Muroran, Hokkaido 050, Japan
Biosci Biotechnol Biochem 1993 **57** (5) 845
Production of α -amylase by an immobilized thermophilic *Bacillus* strain under nitrate respirations
Kusnadi AR, Ford C, Nikolov ZL*// *Iowa State Univ Sci & Technol, Dept Food Sci & Human Nutr, 2312 Dairy Ind Bldg, Ames, Ia 50011, USA
Gene 1993 **127** (2) 193
Functional starch-binding domain of *Aspergillus* glucoamylase I in *Escherichia coli*
Pandey A, Radhakrishnan S// CSIR, Reg Res Lab, Trivandrum 695019, India
Process Biochem 1993 **28** (5) 305
The production of glucoamylase by *Aspergillus niger* NCIM-1245
Slugenova M, Bukovska G, Turna J*, Timko J// *Slovak Acad Sci, Inst Molec Biol, Dubravska Cesta 21, CS-84251 Bratislava, Slovak Rep
Biotechnol Lett 1993 **15** (5) 483
Enhanced α -amylase production by chromosomal integration of pTVA1 in industrial strain in *Bacillus subtilis*
Suominen I, Ford C, Stachon D, Heimo H, Niederauer M, Nurmela H, Glatz C// Univ Turku, Dept Biochem, SF-20500 Turku 50, Finland
Enzyme Microb Technol 1993 **15** (7) 593
Enhanced recovery and purification of *Aspergillus* glucoamylase from *Saccharomyces cerevisiae* by the addition of poly(aspartic acid) tails