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PATENTS AND LITERATURE

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The objective of this section is to keep readers aware of significant inventions and trends in industrial research, as well as to highlight those areas of research that may lead to new biotechnological opportunities. In addition to enzymes and cells in organic solvents covered in the last issue, four other subject areas will be examined in later issues: protein engineering, DNA probes for clinical applications, mammalian cell culture, and microbial transformations. The subject of this, the second Patents and Literature section of 1986, is applications of polysaccharides.

Applications of Polysaccharides

Patents

This section identifies and gives a brief description of patents from the US patent literature from November 1984 to November 1985. The major search terms were: for animal polysaccharides—hepar, chondroitin, and hyaluron; for microbial polysaccharides—xanthan, dextran, pullulan, scleroglucan, and curdulan; and for plant polysaccharides—pect and gum (cellulose and starch were excluded from this search). The term polysaccharide was also searched. Both US patent abstracts and titles were searched. Copies of US Patents can be obtained for $1.50 each from the Commissioner of Patents and Trademarks, Washington, DC 20231.

POLYSACCHARIDES DERIVED FROM ANIMAL SOURCES

Balazs, E. A., Wedlock, D. J., and Phillips, G. O.
POLYMERIC ARTICLES MODIFIED WITH HYALURONATE
US 4,487,865, Dec. 11, 1984
Assignee: Biomatrix, Inc.

and

Balazs, E. A., and Leshchiner, A.
HYALURONATE-MODIFIED POLYMERIC ARTICLES
US 4,500,676, Feb. 19, 1985
Assignee: Biomatrix, Inc.

Polymeric materials, including polyurethanes, polyesters, polyolefins, polyamides, polysiloxanes, and vinylic and acrylic polymers, are rendered biocompatible by including hyaluronic acid with the polymeric material. The hyaluronic acid may be coated onto the surface of the polymeric material or dispersed throughout the body of the polymeric material or both. The hyaluronic acid on the surface of the polymeric material may also be cross-linked. The biocompatible polymeric materials are used in the making of various prosthetic devices, including heart valves, intraocular lenses, vascular grafts, pacemaker leads, and the like.

Langer, R. S., Linhardt, R. J., Cooney, C. L., Fitzgerald, G., and Grant, A.
HEPARINASE-DERIVED ANTICOAGULANTS
US 4,396,762, Aug. 2, 1983
Assignee: Massachusetts Institute of Technology

A heparin product that is obtained by the degradation of heparin with heparinase from *Flavobacterium heparinum* is described. This heparin product can reduce the coagulation activity of factor X without affecting the coagulation activity of thrombin.

Lasker, S. E.
ANTITHROMBOTIC AGENT
US 4,533,549, Aug. 6, 1985

A new antithrombotic agent, a derivative of heparin that can be administered orally, topically, or parenterally to antagonize the effect of factor Xa to a greater extent than commercial porcine heparin is described. In addition, the derivative has insignificant USP anticoagulant and platelet aggregating activities. The heparin derivative, according to the invention, has a molecular weight of about 2500–4000 and gives a positive metachromatic test for sulfated polysaccharides. When isolated as the sodium salt, the derivative contains, by element analysis, 26.2% C, 4.33% H, 1.98% N, 7.1% S, and 9.8% Na; the molar ratio C:N:S:Na is about 10:1.5:2:4.

Lormeau, J. C., Choay, J., Goulay, J., Goulay–Heir, M. T., Goulay–Heir, M. A., and Goulay–Heir, G.
MUCOPOLYSACCHARIDE COMPOSITION HAVING A REGULATORY ACTION ON COAGULATION, MEDICAMENT PROCESS FOR PREPARATION AND METHOD OF USE
US, 4,486,420, Dec. 04, 1984
Assignee: Choay, S. A.

A mucopolysaccharide fraction is obtainable from heparin or from heparin fractions of molecular weights of 2000–50,000, which has a Yin–Wessler titer that is high relative to the USP titer. It contains components whose molecular weights are less than 10,000, particularly oligosaccharides in the area of 2000–3000, comprising from 8 to 12, notably 10, monosaccharide units, among which are glucosamine units whose primary positions are sulfated. These oligosaccharides include one *N*-acetyl-glucosamine unit per two units of 2-*O*-sulfate iduronic acid and per two *N*-sulfate-glucosamine units, the other saccharide units being different, having distinct substituents.

Lormeau, J. C., Petitou, M., and Choay, J.
MUCOPOLYSACCHARIDES HAVING BIOLOGICAL PROPERTIES, PREPARATION AND METHOD OF USE
US 4,500,519, Feb. 19, 1985
Assignee: Choay S. A.

Mucopolysaccharides that are biologically active and more specific than heparin, particularly with respect to blood factor Xa are described. These mucopolysaccharides may be obtained by the controlled partial depolymerization of heparin by the action of a chemical agent, such as nitrous acid. The conditions implemented allow the preparation of mucopolysaccharides having a USP titer lower than that of the starting heparin and a Yin–Wessler titer at least equal to that of heparin. These products may be used particularly as antithrombotic drugs.

Soll, D. B., and Harrison, S. E.
PROTECTION OF HUMAN AND ANIMAL CELLS SUBJECT TO EXPOSURE TO TRAUMA
US 4,486,416, Dec. 4, 1984

Damage to endothelial and epithelial cells subject to surgery can be minimized using chondroitin sulfate. This method is particularly useful when applied prior to ophthalmic surgery, particularly intraocular lens implantation surgery.

Teng, L. L.
ORALLY ADMINISTERED HEPARIN
US 4,510,135, Apr. 9, 1985
Assignee: Research Corp.

An orally administrable heparin complex with: (1) a protonated tertiary organic ammonium ion having the formula $R^1R^2R^3NH$, where R^1, R^2, and R^3 each independently represent a branched or unbranched alkyl group of 1–12 carbon atoms that may be substituted with hydroxy or alkoxy groups, of R^1 and R^3 together with a nitrogen atom can form a pyrrolidine, imidazole, or morpholine ring; or (2) an ester-containing quaternary ammonium ion having the formula $R^5R^4R^6N^+R^8CHO_2CR^7$,

where R^4, R^5, and R^6 each represent a branched or unbranched alkyl group of 1–12 carbon atoms that may be substituted with hydroxy or alkoxy groups, or R^4 and R^6 together with a nitrogen atom can form a pyrrolidine, imidazole, or morpholine ring; R^7 represents an alkyl group of 4–16 carbon atoms; and R^8 represents a hydrogen atom or a methyl group.

Walton, A. G., Sparer, R. V., and Ekwuribe, N.
CHONDROITIN DRUG COMPLEXES
US 4,489,065, Dec. 18, 1984
Assignee: Valcor Scientific Ltd.

Chondroitin or chondroitin sulfate is covalently or ionically bound, to form a prodrug, to a drug substance of the group consisting of chloramphenicol, methotrexate, adriamycin, vinblastine, vincristine, vindesine, 6-mercaptopurine, 5-fluorouracil, the penicillin antibiotics, and cephalosporin antibiotics, and the 1-oxacephalosporin antibiotics. When injected into animal tissue, these prodrugs undergo natural conversion in the physiological environment to provide controlled release of the drug or an active drug complex.

POLYSACCHARIDES DERIVED FROM BACTERIAL SOURCES

Borchardt, J. K.
METHOD OF VISCOSIFYING AQUEOUS FLUIDS AND PROCESS FOR RECOVERY OF HYDROCARBONS FROM SUBTERRANEAN FORMATIONS
US 4,508,629, Apr. 2, 1985
Assignee: Halliburton Co.

The present invention relates to a method and composition for viscosifying aqueous fluids. When mixed with an aqueous fluid, this composition produces a viscosity increase in the fluid in excess of the additive viscosity of the individual components. The viscosifying composition contains xanthan gum and at least one of the following: ammonium, hydrogen, or alkali metal salts of polystyrene sulfonate, polyvinyl sulfonate, and hydrolyzed copolymers of styrene sulfonate and maleic anhydride.

Bracke, J. W., and Thacker, K.
HYALURONIC ACID FROM BACTERIAL CULTURE
US 4,517,295, May 14, 1985
Assignee: Diagnostic, Inc.

Hyaluronic acid is prepared in high yield from *Streptococcus* organisms by fermenting the bacteria under anaerobic conditions in a CO_2-enriched growth medium, separating the bacteria from the resulting broth and isolating the hyaluronic acid. The bacteria may be grown free of endotoxins by filtering all ingredients through a 10 K Millipore filter prior to inoculation of the medium and subsequently maintaining pyrogen-free conditions. Separation of the microorganisms from the polysaccharide is facilitated by killing the bacteria with trichloroacetic acid. After removal of the bacterial cells and concentration of the higher-molecular-weight fermentation products, the hyaluronic acid is isolated and purified by precipitation, resuspension, and reprecipitation.

Brocklehurst, P., and Ferguson, A. S.
DRY POWDER COMPOSITIONS FOR PREPARING PAINT STRIPPERS
US 4,502,891, Mar. 5, 1985
Assignee: Sterling Drug Inc.

Alkaline paint-stripper compositions containing either a fibrous material or a combination of a xanthan gum and hectorite clay so as to provide a pellable skin over a painted surface are described.

Gordon, L. K.
HAEMOPHILUS INFLUENZAE B POLYSACCHARIDE–DIPHTHERIA TOXOID CONJUGATE VACCINE
US 4,496,538, Jan. 29, 1985
Assignee: Connaught Laboratories, Inc.

A water-soluble covalent polysaccharide–diphtheria toxoid conjugate, having a molecular weight between 140,000 and 4,500,000 and a ribose/protein ratio between 0.25 and 0.75, is described. This conjugate is capable of producing a T-cell-dependent antibody response to polysaccharide from *H. influenzae* b and is prepared by mixing a derivatized diphtheria toxoid with a cyanogen halide-activated capsular *H. influenzae* b polysaccharide hapten. The polysaccharide is first heat sized to a molecular weight between 200,000 and 2,000,000.

Hayes, H.
DENTIFRICE PREPARATION
US 4,529,585, Jul. 16, 1985
Assignee: Colgate–Palmolive Co.

A dentifrice preparation of desirable rheological properties, suitable for efficient filling into, and extrusion from, a mechanically operated or pressure differential dentrifrice dispenser is described. The dentifrice is comprised of an alpha-alumina trihydrate polishing agent, many active ingredients, and a gelling agent mixture of xanthan and iota-carrageenan.

Inoue, S., and Yamamoto, H.
AQUEOUS INK COMPOSITIONS FOR BALL-POINT PENS
US 4,545,818, Oct. 8, 1985
Assignee: United Kingdom Atomic Energy Authority

An aqueous ink composition for ball-point pens is described. The ink is comprised of: (i) an aqueous medium containg a wetting agent; (ii) a water-soluble or -dispersible coloring agent; (iii) xanthan gum; and (iv) an (optionally) permeable organic solvent.

Nonomura, A. M., and Pappo, R.
COMPOSITION OF MATTER FROM *Cryptosiphonia woodii* USEFUL FOR THE TREATMENT OF HERPES SIMPLEX VIRUS
US 4,522,814, Jun. 11, 1985
Assignee: Pappo, Raphael

A water extract of homogenized *Cryptosiphonia woodii* is useful for the treatment of herpes simplex viral infections. The active agent is a polysaccharide-containing glucose and galactose. Herpes infections may be treated in subjects by administering an effective amount of an aqueous extract of *C. woodii.* This treatment is effective both prior to and subsequent to infection. It may involve topical application to alleviate symptoms or may be systemic, by oral administration, to eradicate the virus and prevent symptom recurrence.

Schweid, J. M., Cohee, A. H., and Dec, A. F.
EMULSIFICATION SYSTEM FOR CREAMY-FOOD PRODUCTS
US 4,539,215, Sep. 3, 1985
Assignee: General Foods Corp.

Described is a dry mix containing an emulsification system including a combination of Polysorbate 60, xanthan gum, and lecithin, that can be used to produce a creamy and stable fluid emulsion by handshaking the dry mix with an aqueous and an oil phase. The amount of shaking required to produce a stable oil-in-water emulsion is much reduced compared to other emulsification systems.

Shay, L. K., and Reiter, S. E.
AMINE TREATMENT OF POLYSACCHARIDE SOLUTION
US 4,485,020, Nov. 27, 1984
Assignee: Phillips Petroleum Co.

A thermostable, viscous xanthan polysaccharide solution is prepared by the process of heating a xanthan polysaccharide solution in the presence of a 1–12-carbon alkyl or a 3–10-carbon cycloalkyl substituted primary or secondary mono- or diamine, having an upper limit of a total of 15 carbon atoms, to form a thermostable, viscous xanthan polysaccharide solution. The thermostable, viscous xanthan polysaccharide solution may be used as a mobility buffer in a processs for the enhanced recovery of oil.

Turrisi, L.
LOW-CALORIE SYRUP
US 4,528,205, Jul. 9, 1985
Assignee: Lever Brothers Co.

A reduced-calorie, edible syrup, containing a mixture of alginate and clarified xanthan gum exhibiting special thickening and organoleptic properties, is described. Butter-containing syrups with this gum combination exhibit good phase stability.

Umezawa, I., and Komiyama, K.
ACIDIC POLYSACCHARIDE CH-1 ISOLATED FROM *Chlorella pyrenoidosa* AND THE USE THEREOF
US 4,533,548, Aug. 6, 1985
Assignee: Kitasato Institute

The production of a new acidic polysaccharide, isolated from a culture of cells of the algae *Chlorella pyrenoidosa,* is described. This substance exhibits antitumor and antiviral activities and induces the production of interferon.

Williams, D., and Munnecke, D. M.
REDUCED BIODEGRADABILITY IN A POLYMER FLOOD PROCESS
US 4,517,101, May 14, 1985

In a polymer flood, in which bacterial contamination causes a loss in viscosity of the polymer, the viscosity of the polymer solution is maintained by the use of a xanthan polymer modified by methylation.

Zahradnik, R. T.
NEUTRAL TOPICAL SODIUM FLUORIDE GEL
US 4,540,576, Sep. 10, 1985
Assignee: Johnson & Johnson Dental Products Co.

Described is a neutral, topical, sodium fluoride gel, consisting of a thickened, buffered, aqueous solution of sodium fluoride (pH 6–8) and a mixture of xanthan gum, with a soluble salt of polymer acrylic acid as a thickener.

POLYSACCHARIDES DERIVED FROM PLANT SOURCES

Arizono, K., Terasawa, M., and Nobutoki, M.
PANOPROFEN GELLED OINTMENT
US 4,525,348, Jun. 25, 1985
Assignee: Yoshitomi Pharmaceutical Industries, Ltd.

Described is an antiinflammatory and analgesic gelled ointment containing pranoprofen and at least one of the following organic solvents:

lower-aliphatic alcohol, polyethylene glycol, methyl ethyl ketone, and/or acetone; one of the following gelling agents: carboxyvinyl polymer, hydroxyethyl cellulose, alginic acid, and/or carboxymethyl cellulose; one of the following water-soluble bases: ammonia, sodium hydroxide, potassium hydroxide, triethanolamine, diethanolamine, diisopropanolamine, triispropanolamine, and/or triethylamine; and water.

Borchardt, J. K.
METHOD OF VISCOSIFYING AQUEOUS FLUIDS AND PROCESS FOR RECOVERY OF HYDROCARBONS FROM SUBTERRANEAN FORMATIONS
US 4,524,003, Jun. 18, 1985
Assignee: Halliburton Co.

A method and composition for viscosifying aqueous fluids. When mixed with an aqueous fluid, this composition produces a viscosity increase in the fluid in excess of the additive viscosity of the individual components. The viscosifying composition contains at least one member from each of the following groups: (i) sulfonated guar combined with either xantham gum, guar, hydroxypropyl guar, hydroxypropyl guar derivatives, hydroxyethyl cellulose, or hydroxyethyl cellulose derivatives; and (ii) cationic guar combined with either hydroxypropyl guar, hydroxypropyl guar derivatives, hydroxyethyl cellulose, or hydroxyethyl cellulose derivatives.

Bergwitz, L. C. A., and Osterlund, R. G. L.
NOVEL PHARMACEUTICAL COMPOSITION
US 4,536,495, Aug. 20, 1985
Assignee: KabiVitrum AB

Carrageenan-complexed drugs, including emepronium, doxycycline, and propanolol, are used in pharmaceutical preparations.

Brain, C., and Johnston, B.
SPREADABLE HONEY
US 4,532,143, Jul. 30, 1985
Assignee: The J. M. Smucker Co.

A semigelled honey composition that is spreadable and will not crystallize, is described. It is prepared by combining honey with low- and high-methoxyl pectins (in ratios of 1:1 to 1:5) in the absence of added alkaline earth metal cations and acid.

Brooker, L. G.
RELEASE SHEETS FOR LAMINATES WITH WAX AND ALGINATE SALT RELEASE LAYER
US 4,510,199, Apr. 9, 1985
Assignee: Westinghouse Electric Corp.

A release sheet useful in laminating assemblies is made, containing a thermosetting, resin-impregnated, fibrous-core layer, release coated on at least one side with a mixture of wax and alginate salt in a ratio of 3–15:1.

Chang, T. S., Zientek, L. J., and Viniguaz, A.
DENTURE FIXATIVE COMPOSITION WITH PARTIALLY NEUTRALIZED AND CROSS-LINKED POLYACRYLIC ACID
US 4,542,168, Sep. 17, 1985
Assignee: Block Drug Co. Inc.

Described is a denture-fixative composition that contains, as the active fixative, a partially neutralized and crosslinked polyacrylic acid and at least one hydrophilic polymer, preferably sodium carboxymethyl cellulose, hydroxypropyl guar, or sodium alginate.

Chibata, I., Tosa, T., and Takamatsu, S.
PROCESS FOR PREPARING IMMOBILIZED MICROORGANISM
US 4,526,867, Jul. 2, 1985
Assignee: Tanabe Seiyaku Co., Ltd.

A process for preparing an immobilized microorganism is described. A microorganism is cultivated in a culture broth, the broth treated with glutaraldehyde, the microbial cells collected from the broth, the microbial cells mixed with an aqueous solution of a polysaccharide having 10 w/w % or more of sulfate moiety, and then the mixture gelled to entrap the microbial cells. The process is suitable for the industrial preparation of immobilized microorganisms.

Doehnert, D. F., and Hill, A. S.
STOMA SEAL ADHESIVE
US 4,505,976, Mar. 19, 1985
Assignee: Johnson & Johnson Products, Inc.

Described is a pressure-sensitive adhesive having the capacity to absorb at least about 7% of its own weight in water and having a desirable combination of plasticity and wet-stick characteristics, as well as good dry-skin adhesion. This adhesive is particularly suitable for use as a stoma-seal adhesive comprised of (i) about 30–80 parts by weight each of (a) a pressure-sensitive adhesive component comprising a synthetic or natural gum and (b) a moisture absorbing component comprising a synthetic carbohydrate or natural water-soluble or swellable hydrocolloid, together with (ii) 2–20 wt% silica.

Gaehring, D. P., and Scanlon, J. V.
TEXTURE PRESERVATION FOR DICED FRESH-FOOD PRODUCTS USING GELLED POLYURONIC ACIDS
US 4,504,504, Mar. 12, 1985
Assignee: Campbell Soup Co.

Described is a process for preserving the natural texture of diced, pectin-containing, fresh fruit and vegetable products through the rigors of conventional heat and acid sterilization procedures. Fruit or vegetable products are first impregnated with an aqueous polyuronic acid-containing solution and then contacted with an aqueous source of divalent metal cations for gelling the absorbed acid.

Hansen, G. D.
PURIFICATION OF SECONDARY-RECOVERY WATERFLOOD LIQUIDS
US 4,502,959, Mar. 5, 1985
Assignee: Atlantic Richfield Co.

Polysaccharide gums, such as guar gum, are removed from an aqueous liquid by agglomerating the gum with a low-molecular-weight, water-soluble copolymer of styrene and maleic anhydride.

Hellsten, K. M. E.
PROCESS FOR FROTH FLOTATION
US 4,545,898, Oct. 8, 1985
Assignee: Berol Kemi AB

A process for froth flotation of phosphate ore with a high carbonate content is carried out in the presence of a hydrophilic polysaccharide and an amphoteric compound.

Horton, R. L.
PREPACKAGED CROSSLINKED POLYMER
US 4,505,826, Mar. 19, 1985
Assignee: Smith International Inc.

Described is a mixture of dry ingredients capable of forming a crosslinked polymer upon hydration for use as a fracturing fluid in processes for recovering minerals from subterranean formations. The dry mix contains a polysaccharide, a crosslinking agent selected to become active after the polysaccharide has been substantially hydrated, and a pH-adjusting agent to facilitate the crosslinking reaction. The mix is hydrated while being pumped and reaches maximum viscosity in the subterranean formation.

Kennedy, R. B.
PECTIN AND RELATED CARBOHYDRATES FOR THE PREPARATION OF POLYURETHANE FOAMS
US 4,520,139, May 28, 1985
Assignee: Crehan, Patrick James and Fricke, Richard J.

Gel-forming polysaccharides, such as pectin, are reacted with polyisocyanates to form useful polyurethane foams.

Kohn, R. S.
THIXOTROPIC AQUEOUS SOLUTIONS CONTAINING A CROSS-LINKED POLYGALACTOMANNAN GUM
US 4,549,907, Oct. 29, 1985
Assignee: Celanese Corp.

A thixotropic aqueous solution containing a thickening agent consisting of polygalactomannan gum crosslinked with a diglycidyl ether of polyoxyalkylene diol is described. This solution is characterized by excellent heat stability and high tolerance to the presence of inorganic salts. A unique property of this thixotropic aqueous medium is a gradual, time-depenent restoration of high viscosity after the cessation of high shear deformation.

Kruger, Jr., A. J., and Johnson, J. K.
BEVERAGE-CLOUDING AGENT BASED ON CARNAUBA WAX
US 4,508,744, Apr. 2, 1985
Assignee: The Coca Cola Co.

Described is a clouding agent, free of brominated vegetable oils or glyceryl abietate, that produces a nonringing, taste- and precipitation-free cloud in still or carbonated beverages. This clouding agent is comprised of carnauba wax, a water soluble gum, water, a polyhydric alcohol of 2–6 carbons, and an edible salt.

Kuu, W. Y.
IMMOBILIZED BIOCATALYSTS
US 4,518,693, May 21, 1985
Assignee: Research Corp.

Biocatalysts, such as microbial cells, are immobilized by forming spherical gel beads containing the microbial cells from a hydrogel, such as agar or carrageenan. The beads are incubated for a time sufficient to permit the microbial cells to produce CO_2, decreasing the resistance of the beads to diffusion. Monomer, crosslinking agent and accelerator are diffused into the beads, and a polymerization initiator is used to cause polymerization of the monomer. The polymerized monomer prevents breakup, which is characteristic of hydrogels containing growing microbial cells. This method is particularly suitable for the immobilization of microbial cells for use in fermentation to produce ethanol.

Larsson, V. K.
PROTECTIVE LAYER ON SKIN, MUCOUS MEMBRANE, OR OTHER BODY TISSUE
US 4,505,935, Mar. 19, 1985

A layer can be formed on skin, mucous membrane, or other tissue by first applying an ointment on the skin or mucous membrane. The ointment

contains a water-soluble alginate and an aqueous dispersion of hydrophilic lipid crystals. A calcium salt is then applied on the surface of the ointment, which converts the alginate to insoluble calcium salt. Pharmaceutically active components may be included in the ointment.

Mezzino, J. F., and Chuang, L. Y.
PECTIN-BASED CLOUDING AGENT
US 4,529,613, Jul. 16, 1985
Assignee: General Foods Corp.

An improved cloud system that imparts enhanced mouth-feel and optimum opacity to a reconstituted beverage-mix is described. The cloud system is composed of a water-soluble polymeric carrier component, a pectin stabilizing agent, and titanium dioxide as the opacifying agent.

Michnowski, J.
GUAR GUM FOOD BAR
US 4,496,606, Jan. 29, 1985
Assignee: Nabisco Brands, Inc.

Described is a ready-to-eat, high-carbohydrate, low-fat, high-guar gum, dietetic, snack bar composition for a Type II diabetic, comprised of 50–75% carbohydrates, 10–15% protein, 8–15% fat, and 8–12% guar gum.

Miyashiro, Y., Ogawa, M., Yamazaki, Y., and Igarasi, S.
POLYSACCHARIDE BEADS
US 4,493,894, Jan. 15, 1985
Assignee: Takeda Chemical Industries, Ltd.

Described is a matrix consisting of a water-insoluble beta-1,3-glucan gel in the shape of beads (diameter 5–1000 μm), prepared by dispersing an alkaline, aqueous solution of a water-soluble beta-1,3-glucan in a water-immiscible organic solvent and adding an organic acid to the dispersion formed. The matrix is useful as carrier materials for immobilized enzymes, affinity chromatography, gel filtration, ion exchange, and other applications.

Morimoto, K.
EXTRUSION PROCESS FOR SHRIMP OR CRABMEAT ANALOG PRODUCTS USING BOILING GELLING BATH
Us 4,548,823, Oct. 22, 1985
Assignee: General Foods Corp.

Fibrous, proteinaceous material, useful in the formation of shrimp or crabmeat analog products, is prepared by extruding an aqueous solution containing both protein and alginate into a gelling bath in which the extrudate is subject to boiling.

Nochumson, S.
POLYACRYLAMIDE CROSSLINKED WITH A POLYSACCHARIDE RESIN AS ELECTROPHORETIC GEL MEDIUM
US 4,504,641, Mar. 12, 1985 and US 4,542,200, Sep. 17, 1985
Assignee: FMC Corp.

Described is an electrophoresis medium that consists of comprising a copolymer of acrylamide and an ethylenically unsaturated resin formed by replacing at least some of the hydroxyl hydrogens in a polysaccharide with an ethylenically unsaturated group.

Pellico, M.. A.
DENTAL IMPRESSION COMPOSITION
US 4,515,913, May 7, 1985
Assignee: Laclede Professional Products, Inc.

Powdered alginate compositions formulated with a polymer comprising polyacrylamide have enhanced smoothness characteristics upon mixing with water and result in orally settable, dental impression material.

Purinton, Jr., R. J.
AQUEOUS CROSSLINKED GELLED PIGS FOR CLEANING PIPELINES
US 4,543,131, Sep. 24, 1985
Assignee: The Dow Chemical Co.

Pipeline interiors are cleaned by passing a gelled pig, containing an aqueous, crosslinked, gelled, galactomannan gum, through the pipeline. Additives can be included to enhance stability, cleaning ability, and so on. The gelled pigs are particularly effective when used in pig trains containing one or more chemical pig segments in the train.

Reinhardt, F.
PAD-DYEING AND PRINTING SYNTHETIC FIBER MATERIALS, USING DISPERSE DYE AND CARBOXYL SYNTHETIC POLYMER AND POLYSACCHARIDE THICKENER COMBINATION
US 4,502,867, Mar. 5, 1985
Assignee: Hoechst Aktiengesellschaft

The electrolyte sensitivity of carboxyl-containing synthetic thickeners, together with disperse dyestuffs containing anionic dispersants, causes problems upon application. These disadvantages can be eliminated by adding natural thickeners, based on polysaccharides, to the synthetically based products at an acidic pH. In pad-dyeing and printing, the systematic pH adjustment of the thickening mixtures results in considerable color-yield gains.

Sakata, K., and Imai, H.
PROCESS FOR PRODUCING WATER-INSOLUBLE POLYMERS OF UNIFORM SHAPE FROM GELLED SALTS OF ALGINIC ACID
US 4,520,178, May 28, 1985
Assignee: Nippon Oil Co., Ltd.

A process for producing a water-insoluble polymer of uniform shape, having high strength and a desired geometric form, is described. This process consists of dissolving or suspending in water: (a) a water-soluble salt of alginic acid; (b) a hydrophilic, crosslinkable vinyl monomer having two or more radical-polymerizable vinyl groups; and (c) (optionaly) a hydrophilic, radical-polymerizable vinyl monomer, bringing the resulting aqueous solution or suspension into contact with an aqueous solution, causing gelation of the water-soluble salt of alginic acid, forming a water-insoluble gel of uniform shape, and subjecting the gel to radical polymerization to produce a water-insoluble polymer.

Sensabaugh, Jr., A. J., Crepps, D. C., Rice, Jr., W. Y., and Fearrington, Jr., G. W.
TOBACCO PRODUCT
US 4,545,392, Oct. 8, 1985
Assignee: R. J. Reynolds Tobacco Co.

Described is a smokeless tobacco product containing cut tobacco treated with a particulated gum composition that adheres as a discontinuous coating to the surface of the tobacco. The gum composition provides improved "gathering" characteristics and other benefits when the treated smokeless tobacco product is placed in the mouth of the consumer of such products.

Shim, J. L.
GELLAN GUM/GELATIN BLENDS
US 4,517,216, May 14, 1985
Assignee: Merck & Co., Inc.

Blends of gellan gum and gelatin that exhibit a synergistic increase in gel strength are described.

Shimohiro, Y., Ogawa, M., and Ohnishi, T.
THICKENING AGENT FOR PASTE
US 4,548,648, Oct. 22, 1985
Assignee: Dainippon Pharmaceutical Co., Ltd.

A thickening agent for a paste, comprised of a hydroxyalkylated–carboxymethylated product of a tamarind seed powder or a tamarind gum, is described. The thickening agent is excellent in compatibility with a variety of dyes and gives a printing paste with excellent leveling and wash-off properties.

Simon, E.
SELF-EXTINGUISHING CIGARETS
US 4,489,738, Dec. 25, 1984

Specific coatings that are applied to the paper wrapper enclosing the cigaret's smoking medium are used for limiting, in a predictable manner, the free-burning time of the treated cigaret or controlling the lapsed time prior to self-extinguishment after being lit and left unattended. The coating materials are hydrophylic colloids or aqueous-soluble polymers that are deposited from aqueous media and are represented by locust bean gum, pectin, sodium carboxymethylcellulose, and guar gum, forming adherent, nontacky, flexible coatings on the paper housing and significantly altering the burning characteristic of the resultant cigarets. Comparable behaviors are obtained by either precoating the portion of paper wrapper that subsequently encloses the charge of tobacco or by posttreating the external surface of the assembled cigaret.

Stuhler, H., and Krempl, E.
PROCESS FOR PURIFICATION OF ESTERS
US 4,521,595, Jun. 4, 1985
Assignee: Hoechst Aktiengesellschaft

A process is described for the purification of esters containing residues of dissolved and/or undissolved alcohols. The purification of the esters that contain alcohols is achieved by treating the esters, in the liquid state, with an effective amount of water-soluble polysaccharide derivatives in the solid state.

Su, D. T.
GELS FORMED FROM ANIONIC AND CATIONIC POLYMERS
US 4,501,834, Feb. 26, 1985
Assignee: Colgate–Palmolive Co.

The formation of water-soluble and water-insoluble gels by interpolymer reactions of selective anionic and cationic polymers in an aqueous medium is described. Either polymer can serve as a crosslinking agent. The selective cationic polymer is either poly(diallyldimethylammonium chloride), poly(diallyldimethylammonium chloride-co-acrylamide), or a quaternary ammonium cellulose ether polymer. The anionic polymer is either a polysulfonic acid or alginic acid. The formation of the gel structure depends on fast and intensive polymer interaction to ensure a maximum amount of ion-pair formation. The solubility of the gel depends on the formation of intimate or loose ion pairs, which depends on the charge density and structure of the polyelectrolytes. These interpolymer gels exhibit a dramatic increase in viscosity. The water-soluble gels produced can be used as foam enhancers and conditioning agents in cosmetic compositions, such as shaving gels, shampoos, and the like, and in sewage treatment. The water-insoluble gels are clear and of extremely high viscoelasticity and can be made into clear films.

Su, D. T.
SHAVING-CREAM GEL CONTAINING INTERPOLYMER REACTION PRODUCT OF SELECTED CATIONIC AND ANIONIC POLYMERS
US 4,528,111, Jul. 9, 1985
Assignee: Colgate–Palmolive Co.

Described is a stable shaving-cream gel, having superior foaming and after-feel characteristics, containing a water-soluble gel that is the interpolymer reaction product of a quaternized cationic polymer, either poly(diallyldimethylammonium chloride-co-acrylamide) or a quaternary ammonium cellulose ether polymer, with an anionic polymer that is either a polysulfonic or alginic acid.

Szendrei, K., Minker, E., RE, Z., Koch, L., and Wolf, L.
BIOLOGICALLY ACTIVE POLYSACCHARIDE CONCENTRATES AND PROCESS FOR PRODUCTION OF PREPARATES CONTAINING SUCH SUBSTANCES
US 4,511,559, Apr. 16, 1985
Assignee: Kozponti Vlt-s Hitelbank Rt. InnovciAlap

Polysaccharides can be obtained from plants of the genera *Cucurbitaceae, Papilionaceae, Tiliaceae, Labiate, Malvaceae, Asteraceae, Umbelliferae, Rutaceae, Chenopodiaceae, Linaceae, Rosaceae,* and *Plantaginaceae* by water extraction and solvent precipitation. Polysaccharides having a molecular weight of 75,000–2,000,000 and containing <5% N, <5% P, <25% ash, >30% reducing sugar, and >60% total sugar has been shown to have especially antiinflammatory activity.

Szijj, E., and Re, M.
COMPOSITION FOR THE TREATMENT OF EPITHELIAL INJURIES AND PROCESS FOR THE PREPARATION THEREOF
US 4,503,037, Mar. 5, 1985
Assignee: Human Oltoanyagtermelo es Kutato Intezet.

A new pharmaceutical composition suitable for the treatment of injuries to the skin, particularly burns, a process for its preparation, and a method of treatment for skin injuries, is described. The new compositions relieve pain, promote healing, and are locally administered to the injury. The compositions contain 2–28 mg of a tannic compound, 5–30 mg of a carbohydrate, 0.5–6 mg of an anthocyane, and/or a flavonone compound, and/or pectin, 0.2–6 mg of plant wax, and 0.01–0.1 mg of volatile oil and a C(2)–C(4)alkanol to balance to yield 100 mL of composition.

Trop, M.
POWDERED COMPOSITIONS AND PROCESS FOR THE MANUFACTURE OF NONGELLED ACIDIFIED MILK-PRODUCT DRINKS
US 4,530,850, Jul. 23, 1985
Assignee: Ben-Gurion University of the Negev Research and Development Authority

A powdered composition that, upon mixing with milk, forms a nongelled, acidified, milk-product drink without curdling of the milk proteins. The composition contains 1–9% edible acid, 0.5–1.9% instant cold-water soluble gelatin, 1–10% edible natural or modified polysaccharide gum, 20–90% sweetening agents, and an effective amount of flavoring and coloring agents.

Tunc, D. C.
METHOD OF REDUCING NUTRIENT ABSORPTION
US 4,520,017, May 28, 1985

A method of reducing the rate of nutrient absorption in the small intestine of a mammal is described. For this purpose, a composition containing a polysaccharide polymer and a divalent ion is administered to the host in an effective amount to provide a coating or the small intestine, which controls absorption of nutrients.

Ueda, T.
PROCESS FOR PREPARING EDIBLE PRODUCTS IN THE FORM OF CAPSULES
US 4,507,327, Mar. 26, 1985
Assignee: Q. P. Corp.

A process is described for preparing encapsulated foods and drinks filled with a desired edible liquid. The following steps are conducted in the following order: (a) A core liquid is prepared by adding calcium salt to sugar liquid, using additives, if necessary; (b) membranes are formed of calcium alginate on the surface of the core liquid by dropping the core liquid into alginic acid salt liquid; (c) the core liquid inside the capsules is exchanged by soaking the capsules in water; and (d) the core liquid in the capsules is then exchanged with the desired digestible liquid by immersing the capsules in the digestible liquid.

Vellini, M.
POLYSACCHARIDE HAVING ANTIINFLAMMATORY AND PLATELET ANTIAGGREGATION ACTIVITY
US 4,507,286, Mar. 26, 1985
Assignee: Rorer Italiana, S. P. A.

The extraction of a substance endowed with antiinflamatory and platelet antiaggregation activity is described. The juice of plants of various species of the family *Bromeliaceae* is extracted by means of thermocoagulation or trichloracetic acid precipitation from raw juices obtained from their roots or fruits and from previously isolated bromelain.

Wallace, R. B.
THREAD LOCK
US 4,545,712, Oct. 8, 1985
Assignee: The Oakland Corp..

Described is a threaded fastener having a deposit of a fluid polymerizable resin in the bottoms of the thread grooves, a fluid polymerizing agent overlying the resin in the thread grooves, and a strong, nontacky, protective film covering the agent. Between the fluid resin and agent a barrier film is formed, as a result of the resins' polymerization, at which it contacts the polymerizing agent. The fluid resin and agent deposit includes abrasive particles, such as table salt, to enhance mixing when the fastener engages a mating threaded member. In production, the protective film is applied as an aqueous solution of PVA, which is rapidly converted to the nontacky film by the application of a desiccant powder, such as a derivative of guar gum.

Watanabe, K., Yoshikawa, S., and Futami, S.
LOW-DUSTING POWDERY ALGINATE IMPRESSION MATERIAL FOR DENTAL USE
US 4,543,372, Sep. 24, 1985
Assignee: G–C Dental Industrial Corp.

Described is a low-dusting, powdery, alginate, impression material for dental use, consisting of: (a) alginate; (b) gelling agent; (c) a gelation-controlling agent; (d) a filler; (e) a hydrophobic liquid having a vapor pressure of not higher than 3.15 mm Hg at 20°C, either a hydrocarbon or a silicone oil not containing a hydrophilic group; (f) polyvinylpyrrolidone; and (g) either a metal oxide, hydroxide, or fluoride.

Wunder, R. H.
EMULSION POLYMER RECOVERY BY COAGULATION
US 4,536,568, Aug. 20, 1985
Assignee: Polysar Limited

A process is described for the coagulation of rubber polymers from aqueous emulsions in the presence of an additive selected from polysaccharide and vegetable-derived proteinaceous materials. The polymers coagulated by this method are readily dried and may be used for the manufacture of products.

LITERATURE

This section surveys the literature in the area of applications of polysaccharides published from November 1984–November 1985. This section lists only selected articles and reviews that appeared during this time period.

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