

NEW PATENTS

ELECTROCHEMISTRY

Highly Durable Electrodes for Electrolysis

DAIKI ENG. CO. LTD. *European Appl.* 593,372A
Highly durable electrodes, especially for electrolysis in sulphate baths, with high electrocatalytic activity for O₂ evolution, comprise Ti coated with Pt-group metal(s), such as IrO₂, diffused onto an intermediate Ti, Zr, Nb and Ta layer, which changes from a metastable β- to an α-phase by heat-treatment. Electrolysis is stable over long periods at low electrode potentials, by preventing the growth of Ti oxide.

Insoluble Electrode

NIPPON STEEL CORP. *Japanese Appl.* 6/81,198
The insoluble electrode comprises an electrode body, with a first coating of dense IrO₂ having a relative density of 90%, a second coating mainly of IrO₂ with a relative density of 90–50%. The first layer is formed by melting and evaporating metallic Ir in a closed O₂ atmosphere using the ion plating method. The insoluble electrode has excellent corrosion resistance even when undergoing a high current density electrolysis at ≥ 50 A/dm².

Reduction of Carbon Dioxide for Formic Acid

TANAKA KIKINZOKU KOGYO K.K. *Japanese Appl.* 6/93,485
The reduction of CO₂ is performed on opposing gas diffusion electrodes coated with Pt (alloy) and Pd catalyst with intermediate ion production exchange film connected by an aqueous carbonate solution and aqueous hydroxide salt solution. HCOOH is produced from CO₂ and H₂ by using energy of concentration difference after electrolysis. Increasing potential difference between the electrodes produces electric power.

ELECTRODEPOSITION AND SURFACE COATINGS

Selective Deposition of Platinum

U.S. SEC. OF NAVY *U.S. Patent* 5,320,978
Pt is selectively deposited on a (semi)conductive substrate such as Si, GaAs, etc., by applying a patterned polyimide mask layer and depositing Pt by CVD from Pt(PF₆)₄ onto exposed substrate only at a controlled pressure and temperature. The process is used in pattern metallisation of micro-electronic devices with Pt.

Organic Platinum Compounds for Plating

NISSAN CHEM. IND. LTD. *Japanese Appl.* 6/100,578
An organic Pt compound for plating Pt onto ceramics or metal is obtained by reacting dihalogeno(1,5-cyclooctadiene)Pt with a base in the presence of compounds containing H, HC groups of < 10 C, alkoxy of < 10 C or 2–10 C alkoxy, such as diphenyl ethylene. The organic Pt compounds show improved solubilities in terpene alcohol solvents and film-forming properties. Metallic Pt is formed after thermal decomposition giving uniform, continuous thin membranes.

APPARATUS AND TECHNIQUE

Image-Reflecting, Composite Mirrors

MONSANTO CO. *World Appl.* 94/9,180A
A composite mirror consists of ≤ 20 wt.% polymer and ≥ 80 wt.% metal clusters made of Pd, Au or Ag, of < 100 nm diameter, agglomerated on the surface of a substrate. When the metal is Pd or Ag the salt comprises anions selected from acetate, lactate, cyanoacetate, etc. Composite mirrors are used to prepare image-reflecting holograms. The optically variable device can be printed on security documents.

Removing Chlorinated Lime from Tap Water

NIKKI UNIVERSAL CO. LTD. *Japanese Appl.* 6/39,378
An agent for removing chlorinated lime in drinking H₂O has Pt group metal, preferably Pt or Pd, on a porous support, such as Al₂O₃ or a ceramic honeycomb precoated with porous Al₂O₃, with $\geq 80\%$ of the metal supported in depth from surface to 50 μ m. The agent retains removal of high chlorinated lime even after repeated use and good quality drinking H₂O is obtained.

Solubility Measuring Sensor for Metal Oxide

NIPPON STEEL CORP. *Japanese Appls.* 6/50,929–30
A sensor for measuring solubility of a metal oxide in a molten chloride has a Ag electrode in AgCl-NaCl powder held in a protective tube made of Y₂O₃ and/or ZrO₂ with Al₂O₃ and SiO₂, and a Pt electrode immersed in a molten chloride outside the tube. Both electrodes are electrically connected to measure the potential difference between them. The potential corresponding to the amount of the metal oxide dissolved in the molten chloride can be measured over long periods, so can monitor material deterioration.

HETEROGENEOUS CATALYSIS

Production of Highly Pure Terephthalic Acid

MITSUBISHI KASEI CORP. *British Appl.* 2,271,568A
Highly pure terephthalic acid was produced by contacting an aqueous solution of crude acid with H₂ at 260–320°C in the presence of a Pt group metal catalyst, preferably Pd/C. Purification is initiated within 3 min after the aqueous solution reaches 250°C, at the total reaction pressure of 5–15 MPa. The process reduces the time of exposure to a high temperature so as to suppress thermal modification and formation of colouring impurities.

Catalyst for Hydrocarbon Conversion

SHELL INT. RES. MIJ. B.V. *European Appl.* 587,246A
Pd/SiO₂-Al₂O₃ catalyst is prepared by impregnation of a carrier with pore volume of ≥ 1.0 ml/g by contacting with Pd compounds in liquid. The catalyst is highly selective in hydroconversion of hydrocarbon products of Fischer-Tropsch synthesis or in alkane hydroisomerisation. The catalyst is useful in the preparation of middle distillates.

Purification of Oxygen Rich Exhaust Gas

CATALER IND. CO. LTD. *European Appl.* 589,393A
CO, HC and NO_x are removed from O₂-rich exhaust gas, particularly from lean burn vehicle engines, by contacting with a catalyst comprising Pt and/or Pd; Ba; and Fe, Ni, Co, Mg and/or alkali metal supported on a porous carrier. The catalyst maintains high purification rates even after extensive use at high temperatures and when vehicles are used in city driving.

Difunctional Catalyst for Hydroisomerisation of *n*-Paraffins

ENIRICERCHÉ S.p.A. *European Appl.* 590,714A
A difunctional catalyst comprises an X-ray amorphous SiO₂-Al₂O₃ gel with molar ratio of 30:1-500:1, a porosity of 0.3-0.6 ml/g, pore diameter of 10-30 Å and 0.05-5 wt.% Group VIIIA metal. The dual catalyst has both acidic and hydrogenation active sites, and high selectivity for *n*-paraffin hydroisomerisation to yield base oils for lubricants of low pour point and high viscosity index.

Catalytic Reforming of Naphtha

DEGUSSA A.G. *European Appl.* 601,398-99A
Naphtha is catalytically reformed using a Pt group metal catalyst, such as Pt, and a Group IVB metal, optionally Sn, or halogen on a moulded oxide carrier as promoter, such as Zr. In an example, a catalyst contains 0.05-2 wt.% Pt, 0.01-1 wt.% Sn, 0.05-5 wt.% Zr and 0.05-1.5 wt.% Cl, supported on Al₂O₃. The process produces high-octane hydrocarbons for gasoline, and also a high yield of BTX-aromatics, which are used as solvents.

Exhaust Catalyst

FORD FRANCE S.A. *European Appl.* 601,705A
An exhaust catalyst is made by impregnating a support comprising ≥ 50 % γ-Al₂O₃ with an organo-noble metal compound such as Pt, Pd, Rh, in an organic solvent, followed by heating to remove solvent and organic residues. The organo group is alkylcarbonyl or 3-19 C carboxylate, preferably Pd 2-ethyl hexanoate. Catalyst eliminates downstream corrosion by residual inorganics, such as Cl⁻, NO₃⁻, and carrier degradation during impregnation using conventional acidic impregnants. The catalysts has improved light-off temperature, NO_x reduction and longer life at high temperatures.

Preparation of Mixtures of Cyclohexanol with Cyclohexanone

BAYER A.G. *European Appl.* 602,499A
Mixtures of cyclohexanone and cyclohexanol with predetermined ratios of 30-98:70-2 were prepared by hydrogenation of phenol with H₂ using a Pd/carrier catalyst in the gas phase at 150-250°C and 0.8-8 bar. The catalyst is activated and regenerated by high temperature treatment with H₂ and O₂. In order to achieve the predetermined ratios, the specified time-temperature conditions must be maintained. The process requires only one catalyst and one reaction vessel. Cyclohexanol is useful for the preparation of adipic acid and cyclohexanone is used to produce caprolactam.

Nitrogen Oxides Reduction Catalyst

AGENCY OF IND. SCI. & TECHNOL.

European Appl. 602,602A

A novel catalyst for reduction of NO_x in vehicle exhaust emissions or factory waste gases, and using a hydrocarbon as a reducing agent, contains Pt, Ir, Rh and/or Ru plus some Au, and further contains Ce, La, Nd, Ge or Ga oxide in 10²-10⁴ parts by weight with respect to the weight of Pt group metal. The catalyst containing Pt or Ir, etc., is supported on a highly dispersed carrier such as Al₂O₃, SiO₂, TiO₂, zeolites, etc., via ion exchange, followed by deposition of Au or highly dispersed Au hydroxide on the carrier, then by optional reduction with H₂. The catalyst is highly durable and does not require large amounts of hydrocarbon reducing agent.

Palladium Containing Metal Oxide Catalyst

JOHNSON MATTHEY PLC *European Appl.* 602,864A

A Pd catalyst is prepared by co-precipitating metal oxide, such as Fe(III) oxide, Bi molybdate, Ce oxide, with Sb oxide, and Pd particles. The catalyst is used in a chemical reaction, particularly as a hazardous gas sensor. The sensor comprises: a means of contacting the gas with an Fe(III) oxide catalyst at ambient and an indicator for a temperature rise if gas is present. The catalyst is used in oxidative reactions, in sensors to indicate the presence of hazardous gas, such as those used in car exhaust systems to measure catalyst performance. The operating temperature of the reaction is reduced, saving energy and extending the life of the catalyst. The sensor has lower light-off temperature, and greater resistance to deactivation.

Catalyst for Oxidation of Carbon Monoxide

JOHNSON MATTHEY PLC *European Appl.* 602,865A

Catalyst for oxidation of CO to CO₂ comprises metal oxide particles of up to 250 Å in diameter among which are uniformly distributed noble metal particles of diameter < 10 Å. The catalyst is prepared by co-precipitating Pt, Pd, Rh and/or Au particles onto CeO₂ particles and is calcined at 500-900°C. The catalyst is stable, does not need a reducing pretreatment and can be used without a carrier or supported on a monolith. Additionally, hydrocarbons are oxidised to CO₂ and H₂O, and NO_x is reduced to N₂ in the exhaust of vehicle engines, thus leading to less air pollution.

Reforming a Hydrocarbon Feed

CHEVRON RES. & TECHNOLOGY CO.

World Appl. 94/2,438A

A hydrocarbon feed for production of high purity benzene is reformed in the presence of a non-acidic catalyst comprising at least one Group VIII metal and a non-acidic support, such as Pt/zeolite. The reformate is separated into light (< 500 ppm wt. toluene) and heavy fractions, and the light fraction is separated into an aromatic extract stream and a non-aromatic raffinate stream. Catalyst has high selectivity for producing product streams containing 99.95 vol.% benzene. The process can reform a full boiling point hydrocarbon feed to enhance benzene purity, especially in the production of high octane hydrocarbon blending components for gasoline.

Three-Way Catalysts for Exhaust Gas

ALLIED-SIGNAL INC.

World Appl. 94/6,546A and 94/7,600A

Three-way catalysts for removing CO, HC and NOx from I.C.E. exhaust gas comprises first a Group VIII noble metal, such as Pt or Rh, dispersed on a first inorganic oxide support, preferably Al₂O₃, containing ≤ 5 wt.% CeO₂, and additional CeO₂ as an O₂ storage component. This three-way catalyst produced a better removal performance and minimum H₂S. The second catalyst comprises a support containing La and Ce, and Al₂O₃, on a monolithic substrate with an effective amount of Pd. This catalyst performs as well as Pt/Rh containing catalysts.

Fluorinated Saturated Hydrocarbons

NIPPON ZEON K.K.

World Appl. 94/7,829A

A fluorinated saturated hydrocarbon of formula R-CH₂-CH₂-R' is prepared by reacting a fluorinated unsaturated hydrocarbon, R-CF=CF-R' with H₂ in the presence of a Pt catalyst. R, R' = perfluoroalkylene group, or R and R' can combine to form a perfluoroalkylene group. R and R' are preferably 1-4C. The catalyst contains 0.1-10 wt.% Pt on an activated C, Al₂O₃, or SiO₂ support, or a Pt compound such as Pt oxide, colloidal Pt or Pt black. The fluorinated saturated HC is used as a cleaner, solvent, coolant, heating medium or even as an environmentally friendly spraying agent.

Catalysts for Production of Vinyl Acetate

HOECHST CELANESE CORP.

World Appl. 94/8,714-15A

A catalyst used for production of vinyl acetate from ethylene, O₂ and acetic acid is prepared by impregnating a support with H₂O-soluble Pd and Au compounds, converting them to H₂O-insoluble compounds and precipitating them on a support, then reducing to form free Pt group metals. The catalyst can contain a mixture of Au and Pd, using NaOH or KOH fixing solutions; or insoluble compounds are produced by immersing a support with H₂O-soluble chloride salts of Pd and Au in a reactive alkaline solution. The catalyst is ductile and has high activity and selectivity.

Catalytic Production of Hydrogen Peroxide

SHOWA DENKO K.K.

World Appl. 94/12,428A

A process for catalytic production of H₂O₂ from O₂ and H₂ in a reaction medium uses a catalyst made from a Pt group metal supported on Nb oxide, composite Nb oxide, Ta oxide or composite Ta oxide.

Piperazinylorgano-Silane Preparation

DOW CORNING CORP.

U.S. Patent 5,300,641

Preparation of (piperazinylorgano)silanes (1) at normal pressure comprises contacting an (aminoorgano)silane (2) with a piperazine compound (3) and Pd black catalyst at a concentration of 0.1-5 g/mol of (2), at 180-250°C, giving a final molar ratio for (3):(2) of 1.0-3.0. The reaction is carried out as a batch process in a stirred bed reactor with contact time of 5-1200 min, or as a continuous process with contact time of 0.2-120 min and does not require elevated pressure, nor additives, such as K₂CO₃, or Li.

Catalyst for Hydrogenation of Distillate Hydrocarbons

AMOCO CORP.

U.S. Patent 5,308,814

Hydrogenation catalyst suitable for the hydrogenation of HC feedstock with a boiling point of 150-700°C comprises 0.1-2 wt.% each of Pd and Pt on zeolite Y which contains 1.5-6 wt.% Na. The Pd and Pt are incorporated onto the support in a weight ratio of 5:1 to 1:2. The catalyst has improved activity and life, and provides better distillate aromatics saturation, distillate desulphurisation and denitrogenation giving increased cetane number.

Preparation of 1,1,1,2,3-Pentafluoropropane

ALLIED-SIGNAL INC.

U.S. Patent 5,315,048

Preparation of 1,1,1,2,3-pentafluoropropane (1) comprises reductive dechlorination of 1,2,3-trichloropentafluoropropane with H₂ over an Al₂O₃ supported catalyst of Pd, Pt, Ru, Rh and/or Ir, preferably Pd or Pt, in the vapour phase at 140-300°C, with a contact time of 0.1 s to 2 min. (1) is used as a potential replacement for ozone depleting chlorofluorocarbons, as a blowing agent or propellant. High conversions are obtained by recycling at least part of the production stream through the reactor.

Preparation of Serinol or Its Derivatives

KAO CORP.

Japanese Appl. 6/9,512

Serinol or its derivatives, which are useful as medical agents or aminoacid intermediates, are prepared by reductive amination of bihydroxy acetone in the presence of supported catalyst containing more than two kinds of catalysts selected from Pd, Pt, Rh, Ru and Ir, on active C, Al₂O₃, SiO₂ and zeolite. The reaction is carried out in H₂O at 0-150°C for 1-20 h. The ratio of Rh:Pt, Rh:Pt or Ru:Pt is preferably 10-0.0001. The amount of metal in the supported catalyst is 30-0.1 wt.%, preferably 10-0.5 wt.%. Serinol can be prepared in high yield under mild conditions.

Catalyst for Removing NOx from Combustion Exhaust

TOYO KOGYO CO.

Japanese Appl. 6/39,292

A catalyst consists of a metal-containing silicate which is coated with an undercoat of Rh and a top coat of Pt and Ir. The catalyst is produced by loading Rh on the silicate by wash-coating and simultaneous impregnation of Pt and Ir into the support. The Rh catalyst layer is not directly exposed to high temperature exhaust, so that it is not easy to degrade; while the Pt and Ir catalyst layer is exposed directly to exhaust, giving a higher initial activity.

Catalyst for Purification of Exhaust Gas

TOYOTA JIDOSHA K.K.

Japanese Appl. 6/99,072

The catalyst consists of Pt, Pd, Rh, Ir or Ru, and bimetallic silicate with Al and/or Ge in the crystal lattice. Preferably, transition metal, such as Cu or Co, is carried on the bimetallic silicate by ion exchange. NOx in exhaust gas with excess of O₂ can be purified effectively at high temperatures of 250-400°C; the amount of HC adsorbed is increased and NOx decomposition is improved. By putting a Pt metal in the lattice, catalytic activity at 250-350°C is improved.

Neoalcohol Compound Production

HUELS A.G. *German Appl.* 4,230,565
Catalytic direct hydrogenation of 5–13C neocarboxylic acids (1) to the corresponding neoalcohols of formula $R_1R_2R_3C-CH_2-OH$ where $R_{1,2,3} = 1-9C$ alkyl or 6–9C cycloalkyl (2), is carried out at 150–300°C and 50–350 bar at an LHSV of 0.05–0.5/h over Re-Pd activated charcoal catalyst. The Re:Pd ratio is (1–30):1, especially 10:1. (1) are hydrogenated directly, without prior esterification, and 97% selectivity and high conversion are attained.

High Activity Oxidation Catalyst

DEGUSSA A.G. *German Appl.* 4,324,442
A highly active Pt/C catalyst containing Mo and/or Ce as a finely-divided modifier, is used for the oxidation of glyoxal to glyoxylic acid. The weight ratio Pt:Mo and/or Ce is 1:1–10, preferably 1:1–5. The catalyst is prepared by addition of H₂O-soluble Pt and compounds of Mo and/or Ce to an aqueous 5–30 wt.% activated C suspension, heating and simultaneously precipitating Pt with Mo and/or Ce followed by addition of a reducing agent. Improved activity, yield and selectivity are claimed.

Catalyst for Exhaust Gas Purification

MAZDA MOTOR CORP. *German Appl.* 4,333,343
Catalysts for engine exhaust gas purification comprise Pt together with Ir and/or a Group IIIB and/or IVB metal on a support. The catalysts comprise Pt, Ir and optionally Rh, preferably (by weight) 45–92% Pt, < 50% Ir and < 15% Rh. The catalyst have high activity, especially for NO_x reduction over a wide temperature range, and good thermal stability. Also claimed is a catalytic converter containing the above catalyst, where a part of the metal is in the binder.

HOMOGENEOUS CATALYSIS

Preparation of 1,3-Propanediol

SHELL OIL CO. *U.S. Patent* 5,304,691
1,3-Propanediol (1) and 3-hydroxy-propanal (2) are prepared by reacting ethylene oxide with CO and H₂ over promoted *tert*-phosphine-complexed Co carbonyl and Ru catalyst, using a CO:H₂ molar ratio of 4:1–1:6. The catalyst is preferably promoted using an acid chosen from metal salts of Groups IA, IIA or IIB, and rare earth elements. The Co:Ru atom ratio is 1000:1–1:100, and especially 50:1–1:5. (2) is a useful chemical intermediate, and can be readily converted into (1). Conversion of > 62 mol % is obtained.

Preparation of Triorganochlorosilane

DOW CORNING TORAY SILIC. *U.S. Patent* 5,312,949
Triorganochlorosilane (1) containing optionally substituted monovalent HC is prepared by reacting HCl with triorganohydrosilane, such as trialkylsilane, in the presence of Group VIII transition metal or complex. The process is carried out at 50–180°C in the presence of a Pt complex preferably Pt/divinyltetramethyldisiloxane complex or isopropanoic chloroplatinic acid hexahydrate. The process gives high yields of (1) without generation of by-products.

Aryl-Substituted Aliphatic Esters

ETHYL CORP. *U.S. Patents* 5,315,030 and 5,322,959
Aryl-substituted aliphatic esters or alkyl esters, especially ibuprofen ester, are prepared by treating an aryl compound and an alcohol or alkanol with CO, in the presence of a Pd catalyst under ≥ 1 atm pressure and 25–200°C, in the absence of O₂ and H₂O. The catalyst is Pd(0), Pd(I) or Pd(II) compound, such as PdCl₂, PdBr₂, etc., with optionally Cu compounds, and an acid stable ligand, such as triphenylphosphine.

Preparation of Propene Derivatives

KURARAY CO. LTD. *Japanese Appl.* 6/40,954
The preparation of a propene derivative (1) containing organic radical, H or lower alkyl, lower alkyl or aralkyl, uses a Pd catalyst consisting of a Pd salt and a trialkyl-phosphine in ratio 1:1–2 either in the conversion of formic acid ester or in the conversion of a carbonic acid ester, in the presence of HCOOH and a base. The Pd salt is Pd acetate, Pd acetylacetonate, and the trialkylphosphine is tributylphosphine. (1) converts into vitamin D in high yield and high selectivity.

Preparation of Acetals

SAGAMI CHEM. RES. CENTRE *Japanese Appl.* 6/87,781
Acetals are prepared in high yields of 67–93% by contacting olefin with alcohol in the presence of Pd catalyst and Cu salt under a mixture of O₂ and CO. Pd catalyst, such as Pd metal or halide, is used at the ratio of 1/1000–1 equivalent and Cu salt, such as Cu halide, Cu acetate, cuprous halide, at 1/100–1/2 equivalents. Acetals are used as a synthetic material or as intermediates for perfume, agricultural chemicals and medicines, and as organic solvents.

Preparation of Derivatives of Phenyl-Tetrazole

SYNTHELABO *French Appl.* 2,696,745
Phenyl-tetrazole derivatives containing 1–2C alkyl or aryl, aryl-naphthyl, pyridinyl-pyrimidyl, quinolinyl or imidazo-pyridinyl (all optionally substituted) were produced by reacting benzeneboronic acid derivative with aryl halide in a solvent of benzene-toluene, DMF, etc., in the presence of a Pd catalyst and a base. The catalyst is Pd tetrakis (triphenylphosphine) and the base is preferably Na₂CO₃, K₂CO₃ or a tertiary amine. The reaction provides a method for obtaining direct aryl-aryl, aryl-naphthyl and aryl-heterocyclic couplings in the presence of a Pd catalyst.

FUEL CELLS

A Fuel Cell Cathode Catalyst

INT. FUEL CELLS CORP. *World Appl.* 94/10,715A
An alloy catalyst, especially for a fuel cell cathode comprises, in at. %: 40–60% Pt, 10–20% Rh and 20–50% Fe. The catalyst preferably maintains a mass activity for O₂ reduction of ≥ 40 mA/mg Pt at 0.9V, at > 400°F and atmospheric pressure after $\geq 10,000$ h of fuel cell operation at 300–400°F and 0.5–0.8 V. The catalyst is supported preferably on C and is 50–95 wt.% of the support. Catalyst has high physical and chemical stability as well as high activity.

Polycomponent Electrocatalyst

ECOLE POLYTECHNIQUE MONTREAL

U.S. Patent 5,298,343

A catalyst for a fuel cell cathode comprises Pt, Pd, Ru, Rh, Ir and/or Os mixed with tungstic or molybdic acid, Na tungstate or molybdate and/or NH₄ tungstate or molybdate, dispersed on a conductive carrier, preferably C of high surface area graphitised C particles of crystallite size 0.200–0.300 μm. A stable catalyst is produced with increased activity for electrochemical reduction of O₂.

Catalyst for Phosphoric Acid Fuel Cell

FUJI ELECTRIC CO. LTD. *Japanese Appl. 6/124,712*

The catalyst comprises fine particles of Pt, Au and Co alloy, supported on C material; preferably 3–25 wt.% Co, 8–40 wt.% Au and balance Pt. The catalyst is used for a phosphoric acid type fuel cell, having improved higher initial activity and stability. Output and life of the cell are also improved.

ELECTRICAL AND ELECTRONIC ENGINEERING

Interconnecting Via Fill Composition

E. I. DU PONT DE NEMOURS & CO.

European Appl. 591,604A

Composition for manufacture of a fired multilayer electronic structure comprises (by wt.% of total inorganic solids) 90–100% Os, Ir, Ru and/or Rh (alloy) particles, preferably Ru, and 10–0% inorganic binder, preferably 0.5–10%, with softening point 400–1000°C. The mixture is dispersed in a liquid organic medium and conductive vias are formed by filling holes with the composition by screen printing and firing. Different metals, such as Cu and Ag, can be thus connected.

Magneto-Optic Recording Medium

TOSOH CORP.

Japanese Appl. 6/60,448

Magneto-optic recording medium (1) has a recording layer of an artificial lattice of Co, Pt and/or Pd layers laminated alternately on a board. Part of the artificial lattice film on the board side has a shorter lamination period than the other part of the film and is 10–80% of the total film thickness, and consists of (in atomic layers) 0.5–1.5 Co and 1–6 Pt. The other part of the film consists of 1–2.5 Co and 2–8 Pt. (1) exerts a high magneto-optic effect and coercive force without raising the Curie temperature, giving high packing density recording and a high C:N ratio.

Magnetic Recording Medium

SONY CORP.

Japanese Appl. 6/76,260

Magnetic recording medium (1) having formula (Co_aPt_bB_c)_{100-x}O_x, where (in at.%) a = 100–b–c, b = 0–50, c = 0.1–30 and x = 0–15, is an intermediate layer having f.c.c. crystalline structure. (1) relaxes the conditions of partial voltage of O₂ at the time of film formation to obtain magnetic thin films with a high perpendicular azeotropic magnetic field. (1) improves the output and overwrite characteristics of the magnetic recording without reducing the rectangular shape of the perpendicular magnetic curve.

Photomagnetic Recording Medium

MITSUI PETROCHEM. IND. CO. LTD.

Japanese Appl. 6/76,379

The medium consists of a magnetic thin film (1) with perpendicular magnetic anisotropy, which is laminated on both sides of a magnetic thin Pt-Co film. Preferably (1) is a 30–500 Å thick composition modulation magnetic thin film of laminations of at least 1 layer each of 1–15 Å thick Co layers and 2–15 Å thick Pt layers. The medium has improved magnetic properties, and a larger Kerr rotating angle over a wavelength range of 400–850 nm.

Photomagnetic Recording Medium for Rewrite

SANYO ELECTRIC CO. LTD. *Japanese Appl. 6/76,381*

A photomagnetic recording medium has a recording layer comprising reciprocal laminate film with layers containing a transition metal and layers containing noble metal, and alloy layers containing rare earth metal and a transition metal. All being in close contact on a substrate. A photomagnetic recording disk of thickness 200–3000 Å was prepared from 5–20 Å Pt layers and ≤ 10 Å thick Co layers and Tb-Fe-Co alloy layers on a substrate. A smaller magnetic field allowed writing to disk.

Opto-Magnetic Disc with Improved S:N Ratio

HITACHI LTD.

Japanese Appl. 6/103,623

The disc has three magnetic recording layers having different refractive indices or different vertical magnetic anisotropical energies on a substrate with an uneven guide groove. The optomagnetic effect is enhanced and S:N ratio is improved. In an example, a Tb-Co-Nb first magnetic layer (20 nm), Pt-Co second magnetic layer (10 nm), and Tb-Dy-Fe-Co-Ti third magnetic layer (50 nm) were successively applied on a SiN layer. In three magnetic layers, vertical magnetic anisotropy was highest in the third layer and lowest in the second layer.

Film Forming Method for Artificial Grid Multilayer Recording Medium

JAPAN ENERGY K.K. *Japanese Appls. 6/111,403–04*

A transition metal/Pt group metal, preferably Pt or Pd, artificial grid is formed by sputtering multilayers of film. The sputtering pressure for the Pt or Pd metal layer is kept higher, preferably at 0.5–5.0 Pa, than for the transition metal layer which is kept at 0.1–1.0 Pa. The medium has higher coercivity and improved corrosion resistance.

Magnetic Recording Medium with High Recording Density

TDK CORP.

Japanese Appl. 6/124,832

Magnetic recording medium has a continuous thin film type magnetic layer comprising (by in.%) 5–40 Pd, 10–30 O, and balance substantially Co, on a non-magnetic substrate. It is used for in-plane magnetic recording media capable of high density recording.

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