

NEW PATENTS

METALS AND ALLOYS

Platinum-Palladium-Gold Alloy for Decorative Use

CITIZEN WATCH CO. LTD *Japanese Appl. 4/147,932*
A Pt-Pd-Au alloy containing 85–95% Pt, 2–10% Pd, 1–5% Au and at least one of Ru, Ni, Co, Cu and 0.2–5.0% Cr in total, is used for the outer dressing of a wrist watch. The alloy has a brighter Pt colour tone, excellent machining and polishing performance, and scratch resistance.

Palladium Metal Powders

NE COMECAT. K. K. *Japanese Appl. 4/210,481*
Ready mixed powder is composed of Pd or Pd alloy, containing 60% Pd of an average grain size of 50 Å and includes organic Rh or In compounds as 0.005–1.0 wt.% metal. The super pulverised metal powder is dispersed in an organic solvent and made into a thin film on the substrate. The powder gives reduced delamination and/or cracking of the coated layer, and is used for wiring hybrid IC devices.

CHEMICAL COMPOUNDS

Preparation of Platinum Group Metal Carboxylates for Catalysts

MOONEY CHEM. INC. *World Appl. 92/10,460A*
Pt group metal or Re carboxylates are prepared from a mixture of at least one alkali or alkaline earth metal salt of a carboxylic acid, at least one Pt group metal or Re salt having a different anion and an organic liquid, by maintaining below the decomposition temperature of the components or products. A heterogeneous catalyst can be prepared by supporting the composition on a solid substrate and heating to decompose. This method provides Pt group metal and Re salts of organic carboxylic acids, useful as homogeneous catalysts, and for preparing heterogeneous catalysts, printed circuits and electrical contacts.

Iridium Composite Oxides with High Electroconductivity

TOSHIBA K.K. *Japanese Appl. 4/130,021*
Composite oxides having layered crystal structures consist of Ir; alkaline earth elements which are at least one of Ba, Ca and Sr; oxygen; and either (a) at least one of the rare earth elements including Y, (b) at least one of the alkali metals Na and K, or (c) at least one of F, Cl and Br. This method produces composite oxides containing Ir which show high metallic electroconductivity at room temperature, together with super electroconductive characteristics at low temperature.

Preparation of Tetraammine Platinum Complexes

N.E. CHEM. CAT. K.K. *Japanese Appl. 4/169,593*
Tetraammine Pt complexes, for example tetraammine Pt(II) bicarbonate, can be prepared simply and effectively by adding at least one salt selected from soluble carbonates, bicarbonates and carbamates to a solution containing tetraammine Pt complex ions. The complexes can be prepared at low cost and can be used for catalysts and plating.

ELECTROCHEMISTRY

Electrochemical Detection System with Microelectrode Array

U.S. DEPT. ENERGY *U.S. Patent 5,120,421*
An electrochemical detection system consists of a microelectrode array detector of discrete sensing elements, and an electronic means for receiving, converting and displaying the information. The electrodes used are preferably of Pt, Ir, Au, C, V, or a chemically modified electrode, or Ag may be used. The system is used to determine the type and concentration of elements present in testing solutions, effluents, and so on. The detector has high sensitivity, high signal:noise ratio, and may be incorporated into a hand-held system.

Rejuvenation of Electrochemical Cell Membranes or Diaphragms

DOW CHEM. CO. *U.S. Patent 5,133,843*
A membrane or diaphragm from an electrochemical cell having a metallic coating, preferably Pt or Pt oxide, is rejuvenated by treating with an inorganic acid solution of aqua regia at 35–70°C to dissolve the metallic particles, and treating with a basic solution such as NaOH. The metallic particles, preferably Pt, can be recovered. The method is used for example to improve the performance of a chloralkali cell after a shutdown period by rejuvenating the membrane separator, and can treat for example, membranes made of 'Nafion'.

Electrolytic Manufacture of Palladium Ammine Hydroxides

AT. & T. BELL LAB. *U.S. Patent 5,135,622*
Pd ammine hydroxides are produced by electrolysis at up to 40°C in a cell having a Pt or Pt on Ti anode, a stainless steel or Ni cathode, a catholyte compartment containing OH⁻ ions, a product compartment initially containing Pd(NH₃)_n⁺⁺ ions and anions, an anolyte compartment containing KOH, NaOH or Na₂SO₄, and with fluorinated anion permselective membranes separating the compartments. The process takes place at low temperature, is fast, efficient, and gives products having long shelf lives containing only low amounts of the initial Pd compound.

Insoluble Electrode for Electroplating Process

NIPPON STEEL CORP. *Japanese Appls.* 4/191,398-99

An insoluble electrode consists of an electrode base metal with a valve metal layer, and either (a) a 1000 Å thick IrO₂ heat oxidised layer and a coated and baked layer of IrO₂, or (b) a coated and baked layer of IrO₂ and a 1000 Å thick IrO₂ heat oxidised layer. Preferably the baked IrO₂ film is ~5 µm thick and is formed by coating-drying-baking at 450°C 6-8 times.

Platinum-Titania-Silica Catalytic Electrode

T. MIYANOH

Japanese Appl. 4/193,972

A semiconductor electrode for use in electrolysis is produced by moulding a homogeneous mixture of powdered SiO₂, powdered TiO₂ and Pt black, or by coating a solid material with the mixture, and then sintering the moulding or coated solid. A catalytic electrode is produced, useful for electrolytic oxidation of organic matter in solution.

Titanium Electrode Coated with Platinum and Rhodium

ISHIFUKU KINZOKU KOGYO K.K.

Japanese Appl. 4/210,487

A Ti(-alloy) base electrode is coated with a Pt layer, a Rh oxide layer over the Pt layer, and an oxide coating layer on the Rh oxide layer. The oxide layer comprises 80-100% Pd oxide and 0-20% Rh oxide. The Pt layer is coated with a compound solution which provides the Rh oxide upon pyrolysis and the upper oxide layer by a similar process.

ELECTRODEPOSITION AND SURFACE COATINGS

Palladium Coated Vacuum Cylinder for Molecular Beam Epitaxial Units

NEC CORP.

Japanese Appl. 4/173,962

The inside surface of a vacuum cylinder used for molecular beam epitaxial units and surface analysis and measurement units is coated with Pd. In an example a vacuum cylinder was evacuated and Pd vapour introduced to deposit Pd film on 95% of the total inside surface area. The process reduces the amount of contaminant molecules present.

APPARATUS AND TECHNIQUE

Hydrogen Getter for Cryogenic Vacuum Tube

SAES GETTERS S.p.A.

European Appl. 496,711A

A getter for removing H₂ from a vacuum environment at cryogenic temperatures consists of a 25-1000 µm thick Al strip support coated on one or both faces with particulate Al₂O₃, and then coated with Pd oxide at a wt. ratio of 99.9:0.1 to 50:50, or having Pd oxide present as multiple clusters. The getter functions by oxidising H₂ to H₂O which is directly absorbed by the Al₂O₃ and the PdO without passing through the vapour phase, and the absorption is not limited by the surface area of the getter.

High Surface Area Platinum Recovery System

JOHNSON MATTHEY INC.

U.S. Patent 5,122,185

A Pt recovery system for a nitric acid plant consists of a foraminated element of Pd or a Pd alloy containing a minor amount of another Pt group metal, Au, Mn, Cr, B, Cu or others. The Pd alloy element is contacted with the effluent stream to recover Pt and Rh lost from a Pt-containing catalyst by volatilisation during NH₃ oxidation above 850°C. Average linear velocity across the Pd alloy element is reduced, and the Pd alloy wt. and surface area per unit cross-sectional area is increased, raising collection efficiency.

Proximity Sensor for Detecting Rotary Machine Vibrations

BENTLY NEVADA CORP.

U.S. Patent 5,126,664

A proximity sensor has a coil for detecting rotating machinery which consists of an alloy of 89 wt.% Ag and 11 wt.% Pd, and is provided with a number of turns, for example 132, to give the desired inductance to operate at a radio frequency of 1 MHz. The effective inductance and resistance of the coil are affected by the rotating machinery which proportionately changes the amplitude of the oscillator signal. The coil is suitable for small diameter use, and has relatively low temperature errors — less than 10% over a wide temperature range of operation.

Platinum Laminate Electrode for Use in Sensors

NOK CORP.

Japanese Appl. 4/128,646

A laminate electrode for a sensor consists of Pt laminated on a high melting point metal such as Cr, Ti, Ta, Zr or Nb. The new laminate electrode, especially Pt-Cr or Pt-Nb, has high environmental resistance, that is, it shows little resistance change under high temperature and high humidity conditions.

Method for Analysing the Platinum Component of Car Exhaust Catalysts

TOYO KOGYO CO.

Japanese Appl. 4/138,362

A method for analysing the Pt component of car exhaust purification catalysts involves immersing in a solution of mineral acid to dissolve components other than Pt, separating the Pt component from the carrier in the mineral acid solution without ionisation, separating the Pt component from the mineral acid, and analysing by XRD.

Carbon Monoxide Gas Sensor Having Iron-Palladium Alloy Wire Coils

DENKI JIKI ZAIRYO KENKYUSHO

Japanese Appl. 4/140,656

A CO gas sensor for catalytic combustion uses has an active part and a compensation part positioned in series and made from coils of Fe-Pd alloy wire containing 15-60 wt.% Fe and 40-85 wt.% Pd, or Fe-Pd-Co wire. The coils have improved uniformity and mass-productibility. The sensor temperature is preferably < 200°C, and shows higher CO sensitivity.

Platinum-Rhodium Alloy Crucible for Growing Manganese-Zinc Ferrite Single Crystals

SHINETSU CHEM. IND. CO. LTD.

Japanese Appl. 4/154,697

A crucible of Pt or Pt-Rh alloy is used to grow a Mn-Zn ferrite single crystal with ≤ 500 ppm contamination of Pt and/or Rh by maintaining the whole raw material in the completely melted state for one hour or more before starting crystal growth, and with optional simultaneous ZnO sublimation. Using this method a high quality Mn-Zn ferrite single crystal of low Pt contamination.

Surface Treating Liquid for Dirt Detection on Insulating Substrates

TOPPAN PRINTING CO. LTD. *Japanese Appl.* 4/174,355

A surface treating liquid consists of Pd chloride dissolved in an acid solution with the pH controlled to be not less than 4 by an alkali solution, and preferably includes tartrates, pyrophosphates and citrates. The solution is used to detect the dirty parts of an insulating substrate which have previously been difficult to detect. On contacting the liquid with the substrate the Pd acts as a catalyst to deposit metal by an electroless plating process, thereby detecting the dirty part of the substrate.

Semiconductor Gas Sensitive Device with Platinum-Platinum Black Electrode Layer

OKU SEISAKUSHO CO. LTD. *Japanese Appl.* 4/175,653

A semiconductor gas sensitive device used to sense O_2 and ozone gases at ordinary temperatures has an electrode layer of Pt and Pt black formed on the insulating layer of the gate part of a field effect transistor, and a ceramic layer bonded to the electrode layer using resin. The resin increases the mechanical strength and adhesion of the ceramic layer.

Oxygen Partial Pressure Measurement Sensor for Molten Salt

NIPPON STEEL CORP. *Japanese Appl.* 4/181,155

A sensor consists of a protection tube made of 3–9 mol % CaO and/or 5–12 mol % of Y_2O_3 , and the rest of ZrO_2 , with a Pt powder filling the protection tube, a Pt electrode dipped in the Pt powder, and a Pt electrode dipped in a molten salt outside of the tube. Both Pt electrodes are electrically connected to measure the potential difference between them.

JOINING

Stress-Relaxed Ceramic-Metallic Joint

NIPPON CEMENT K.K. *Japanese Appl.* 4/164,837

A ceramic and metallic member are joined by incorporating 2 mm or more of Pt, Rh and/or an alloy between them and then soldering together using a metallic or oxide solder having a melting point as high as $1083^\circ C$ or over. The Pt, Rh or alloy acts as a stress-relaxation layer and provides a joint for use in an oxidative atmosphere at temperatures over $700^\circ C$.

HETEROGENEOUS CATALYSIS

Platinum Group Metal Catalyst for Hydrogen Peroxide Production

MITSUBISHI GAS CHEM. CO. INC.

European Appl. 498,166A

H_2O_2 is produced with high efficiency by reacting H_2 and O_2 at $0-50^\circ C$ and $3-150$ kg/cm² in water or an aqueous solution containing a H_2O_2 stabiliser, in the presence of a Pt group metal catalyst consisting of (a) Pt or Pd supported on a carrier such as a microporous resin, absorbed on which is a water-insoluble organic halogen compound, or (b) Pt or Pd supported on a carrier with such a compound already absorbed. The absence of halogen ions in the reaction medium reduces dissolution of the catalyst and corrosion of the reaction vessel, and makes their removal from the product unnecessary.

Platinum Catalyst for Preparation of Pyrocatechol Compounds

BASF A.G.

European Appl. 499,055A

Pyrocatechol monoethers or pyrocatechols are prepared by reacting a 2-hydroxycyclohexanonedialkyl metal in the presence of a partially deactivated Pt metal catalyst in the gas phase or in the presence of water. The process is simpler and more economical than previous processes — it does not produce hydroquinone, and does not require high temperatures or a large amount of alkylating agent. The products are used as intermediates in the preparation of pharmaceuticals such as verapanil, perfumes and flavourings such as vanillin.

Iridium-Alumina Catalyst for Hydrazine Decomposition

AGENCY OF IND. SCI. & TECHNOLOGY

European Appl. 499,264A

A catalyst for hydrazine decomposition is prepared by impregnating Al_2O_3 with a solution of Ir chloride in ethyl alcohol, and then drying and firing to give 5–30 wt. % Ir on the catalyst. The catalyst is used for decomposition of hydrazine in a gas turbine or a thruster for altitude control of an artificial satellite, and has higher activity which is lost less readily.

Low Platinum Content Catalyst for Conversion of Aromatic Fractions

LEUNA-WERKE A.G.

European Appl. 499,799A

A catalyst for conversion of industrial C8 aromatic fractions in the presence of H_2 and basic N compounds consists of zeolite crystals covered with 1–5 wt. % Al_2O_3 , and an Al_2O_3 matrix containing 0.01–0.1 wt. % Pt, with a preferred zeolite content of 10–70 wt. %. The catalyst is used for aromatic fractions containing xylenes and up to 30 wt. % ethylbenzene, and isomerises the xylenes to an equilibrium value while dealkylating or isomerising the ethylbenzene. The catalyst contains only one tenth of the Pt in prior art catalysts, is highly selective, and with high activity.

Ruthenium and/or Palladium Hydrogenation Catalysts

BAYER A.G.

European Appl. 501,265A

Hydrogenation catalysts consist of 0.05–5 wt. % Ru, Pd or a mixture of these in 1:9 to 9:1 wt. ratio on a carrier containing niobic acid, tantalic acid or a mixture of these. The catalysts are especially useful for synthesis of cyclohexylamine and dicyclohexylamine compounds by catalytic hydrogenation of the corresponding aniline compounds, and give the products in chosen ratios, higher yields, and have longer useful life than known catalysts.

Palladium Catalysts in Pentafluoroethane Production

ELF ATOCHEM. S.A.

European Appl. 506,525A

CF₃CF₂H was produced by hydrogenolysis in the vapour phase of CF₃CF₂Cl using a 0.1–5 wt. % Pd catalyst supported on Al₂O₃, fluorinated Al₂O₃, or Al₂O₃ fluoride carrier, at 200–350°C, a H₂:CF₃CF₂H = 1–2, and H₂ pressure of 1–50 bar. The carrier was impregnated with an aqueous or organic solution of a Pd derivative. Using this Pd catalyst, the product is obtained with a very high selectivity.

Catalyst for Oxidising Organic Contaminants in Water

UNITED TECHNOLOGIES CORP.

World Appl. 92/13,805A

A catalyst for oxidising aqueous organic contaminants consists of 5–20 wt. % of Pt, Pd, Ir or Ru crystallites, 100 Å or smaller in size, deposited on a high surface area catalyst support such as Al₂O₃, MgO, ZrO₂, SiO₂ or activated C. The catalyst can be used in a catalyst bed to treat a reactor feed stream. The catalyst is used for complete removal of low concentrations of low molecular weight organic contaminants from water streams with a short residence time, low reaction temperature, and a low reaction pressure.

Ruthenium-Zeolite Hydrorefining Catalysts

ELF FRANCE

World Appl. 92/15,399A

A hydrorefining RuS/zeolite catalyst is prepared, and is used for HC charges, particularly in hydrodenitrogenation processes. The Ru-containing catalyst, which is used either alone, or in combination with catalysts of Al₂O₃ containing Ni, Mo, W or Co, gives improved performance in desulphurisation, and particularly in hydrodenitrogenation reactions where the reaction is not inhibited by the presence of quinolines which reduce the denitrogenation yield.

Rhodium-Ruthenium Catalyst Composition for Preparation of β -Hydroxyesters

EASTMAN CHEM. CO.

U.S. Patent 5,135,901

A novel catalyst composition consists of a Rh component which may be a salt or a complex, a Ru component present at 0.001–1000 times the molar concentration of the Rh, and as promoter a compound containing N, P, As or Sb present at 0.1–100 times the molar concentration of the Rh.

Pretreated Noble Metal Catalyst for Naphtha Reforming

EXXON RES. & ENG. CO.

U.S. Patent 5,137,620

A catalytic reforming process involves contacting a naphtha feed at 750–980°C and 5–25 atm with a noble metal reforming catalyst comprising Pt, Pt-Rh, Pt-Ir, Pt-Re, Pt-Sn, Pt-Rh-Ir, Pt-Ir-Re, Pt-Ir-Sn, Pt-Re-Sn or Pd on a support selected from silica, Al₂O₃, SiO₂-Al₂O₃, Sn modified Al₂O₃ or zeolite. Treatment of the catalyst with an unsaturated aliphatic hydrocarbon at 250–550°C lowers its hydrogenolysis activity during the initial stages of reforming; thus reducing the amount of undesirable gaseous hydrocarbons produced and alleviating temperature runaway.

Hydrogenation of Hydrocarbon with Palladium and Platinum Catalysts Supported on Zeolite Y of Specified Sodium Content

AMOCO CORP.

U.S. Patent 5,147,526

A hydrocarbon feedstock of material distillates boiling between 150–170°C is hydrogenated by reaction with H₂ in the presence of a catalyst comprising (a) 0.1–2.0 wt. % Pd, (b) 0.1–2.0 wt. % Pt, and (c) zeolite Y support which contains 1.5–8.0 wt. % Na. The zeolite is generally 40–85 wt. % of the support, which also contains a refractory inorganic oxide, such as Al₂O₃ or SiO₂. The zeolite has Si:Al atomic ratio of 3–10, and Pd:Pt weight ratio of 3:1–1:1.

Noble Metal Catalyst for Preparation of Cyclohexenylpyridine

KOEI CHEM. IND. CO. LTD. *Japanese Appl.* 4/169,572

2,3-Cyclohexenylpyridine is prepared by isomerisation of 1,2,3,4-tetrahydroquinoline at 200–250°C, for 1–7 h, in a N₂ atmosphere, in the presence of 1–50 wt. % of Pd, Rh or Ru. Using this starting material the product is obtained in high yield and with high purity, and can be used as an intermediate for pharmaceuticals and agrochemicals.

Catalyst Composition for Purification of Automobile Exhaust Gases

KAWASAKI STEEL CORP.

Japanese Appl. 4/176,357

A catalyst composition used for the purification of exhaust gases from automobile engines consists of a high silica zeolite ion-exchanged with at least one of Pt, Pd, Rh, Ir and Ru, and a heat resistant oxide containing at least one of Pt, Pd, Rh, Ir and Ru, optionally supported on a monolith support. The catalyst has good activity and durability.

Platinum-Ceria-Alumina Catalyst for Exhaust Gas Purification

KYATARA KOGYO K.K.

Japanese Appl. 4/180,835

An internal combustion engine exhaust gas purification catalyst is prepared by impregnating highly active CeO₂ powder of surface area > 100 m²/g with a solution containing Pt compounds, heating to form a CeO₂/Pt group metal catalyst powder, mixing with active Al₂O₃ powder to form a slurry, coating a catalyst carrier, and impregnating with Pt group metals.

Three-Way Catalyst with Ceria-Platinum Group Metal Component

KYATARA KOGYO K.K. *Japanese Appl.* 4/180,835

A catalyst for purification of internal combustion engine exhaust gases is prepared by impregnating highly active CeO_2 powder of $> 100 \text{ m}^2/\text{g}$ surface area with Pt group metal compounds, heating, mixing with active Al_2O_3 powder to form a slurry, using to coat a catalyst carrier base material, and impregnating with Pt group metals.

Platinum-Carbon Catalyst for Amino-Fluorophenol Production

SUMITOMO CHEM. CO. LTD. *Japanese Appl.* 4/182,456

4-Amino-3-fluorophenol is produced by catalytic reduction of *o*-fluoronitrobenzene with 5% Pt/C in the presence of a S compound and a surfactant (such as quaternary ammonium halides), usually 5–20 wt.% of H_2SO_4 and dodecyl trimethyl ammonium chloride, at 0–200°C for 2–50 h. The obtained compound is isolated and purified by conventional methods. The product is produced in a high yield, for example 94.3% yield, and is used as an agricultural intermediate.

Platinum-Zeolite Three-Way Catalyst for Car Exhaust Purification

TOSOH CORP. *Japanese Appl.* 4/187,244

A three-way catalyst for car exhaust purification consists of a durable support such as a cordierite monolithic support, a coating layer containing zeolite powders treated to remove Al from their surfaces, and Pt loaded on the zeolite layer by ion-exchange. The Pt is hardly aggregated even after high temperature operation for a long time. The catalyst is used to remove hydrocarbons, CO and NO_x from car exhaust, and can remove NO_x with higher efficiency above 600°C.

Noble Metal-Silicate Catalysts for Decomposition of Nitrogen Oxides

TOYOTA JIDOSHA K.K. *Japanese Appls.* 4/193,346–47

NO_x decomposition catalysts consist of at least one of Pt, Pd, Rh, Co and Cu carried on a crystalline Fe silicate or a crystalline Ga silicate. The catalysts are used for decomposing NO_x in the exhaust gas of chemical processes, such as nitric acid production plants, can remove NO_x , hydrocarbons and CO simultaneously from automobile exhaust gas, and can be run after exposure to high temperatures.

Palladium Catalysed Preparation of Substituted Aromatic Carboxylic Acid Esters

UBE IND. LTD. *Japanese Appls.* 4/193,847–49

Substituted aromatic carboxylic acid esters such as hydroxybenzoates are prepared by reaction at 50–200°C and 0.1–5 kg/cm^2 pressure of substituted aromatic bromides, alcohols and CO, in the presence of 0.05–5 wt.% of a Pd catalyst (compared to the bromides) and either amine compounds or inorganic bases. In examples the catalysts used were 10% Pd/C black and $\text{Pd}(\text{Ac})_2$. By this method the esters can be produced in good yields under mild conditions.

Three-Stage Combustion Catalyst System

KOBE STEEL LTD. *Japanese Appl.* 4/197,443

A combustion catalyst system consists of a series of combustion catalysts with the front stage catalyst containing Pt and/or Pd, the middle stage catalyst consisting of a substituted layer aluminate combustion catalyst with Pt and/or Pd added, and a new rear stage substituted layer aluminate combustion catalyst. Alternatively the front and middle stage catalysts may be the same as the middle stage catalyst in the arrangement above. These systems contain both a combustion catalyst exhibiting good ignitability at low temperatures and a combustion catalyst exhibiting high activity at high temperatures.

Ruthenium Catalysed Preparation of Chlorotrifluoroethylene

NIPPON HARON K.K. *Japanese Appl.* 4/202,147

Chlorotrifluoroethylene is prepared by reaction of 1,1,2-trichloro-1,2,2-trifluoroethane with H_2 at 150–400°C, for 1–4 h, in the presence of a catalyst consisting of 0.1–5 wt.% Ru and 0.1–5 wt.% of at least one of Au, Ag, Cu, Te, Tl, Bi and As supported on active C. The high activity of the catalyst gives a high yield of the product (52–90%) in the gas phase without formation of side products, by a one-step reaction. The product can be used as a monomer for functional fluorinated polymers, or as an intermediate for physically active compounds.

Platinum-Lead Catalyst for Preparation of Furan-Dicarboxylic Acid

FURCHIM S.R.L. *French Appl.* 2,669,634

Preparation of 2,5-furan-dicarboxylic acid is effected by oxidation of hydroxymethyl furfural in an aqueous alkaline medium, in a current of O_2 , and using a catalyst consisting of 3–8% Pt and Pb as activator on an activated charcoal support of $> 1000 \text{ m}^2/\text{g}$ surface area, with a 0.6–1.5 wt. ratio of Pb:Pt. The new catalyst can be recycled 8–15 times, gives improved selectivity and conversion, shorter reaction times, no secondary by-products, the Pt consumption rate is reduced and irreversible poisoning is avoided by Pb activation. The product is an important base monomer used to prepare polymers with improved mechanical properties.

Palladium-Alumina Dehydrogenation Catalyst

ARZNEIMITTELWERK DRESDEN G.m.b.H.

East German Patent 298,744

Dehydrogenation of 1,2-diphenylethanes to the corresponding diphenylethenes is effected in the liquid phase, and in the presence of a H acceptor and a catalyst consisting of 1–8 wt.% Pd uniformly distributed throughout a moulded carrier which consists of active Al_2O_3 modified with 2–5 wt.% of an alkaline earth metal oxide. The catalyst can be prepared by a simple process, is easily regenerated, and can be used in the chemical and pharmaceutical industries.

HOMOGENEOUS CATALYSIS

Platinum Complex Catalysts for Hydrosilation Reactions

MINNESOTA MINING & MFG. CO.

World Appl. 92/10,529A and 92/10,543A

An actinic radiation-activated hydrosilation reaction between an unsaturated aliphatic compound and 0.1–10 wt. equivalents of a compound containing Si-H bonds is effected in the presence of 5–1000 ppm of a Pt catalyst, 50–50,000 ppm of a free-radical photoinitiator able to absorb actinic radiation and accelerate the reaction, and optionally 50–50,000 ppm of a sensitizer. The Pt catalyst is an (η^5 -cyclopentadienyl)tri(σ -aliphatic) Pt complex or an (η^2 -diolefin)(σ -aryl) Pt complex. The process can be used to produce low molecular weight Si compounds and to cure polymers, and the composition may be used for dental impressions or release liners.

New Organosilicon Compounds for UV-Curable Coatings

DOW CORNING CORP.

U.S. Patent 5,136,065

A new organosilicon compound is selected from certain silanes or organosiloxanes prepared by the reaction of a propargylester with either a triorganohydrogensilane or an organohydrogensiloxane in the presence of a Pt-containing hydrosilylation catalyst. The Pt catalyzed hydrosilylation reaction of the organohydrogensiloxane occurs exclusively at the propargyl group leading to high product yield. Solutions of organosiloxanes are used for UV-curable coatings and UV absorbers as they form an insoluble crosslinked material when UV irradiated.

Rhodium Catalyst Recovery during Hydroformylation Process

EASTMAN KODAK CO.

U.S. Patent 5,138,101

A low temperature hydroformylation process uses a catalyst of Rh and an organophosphine compound and results in a product solution containing a high-boiling aldehyde, the catalyst components and a hydroformylation solvent. The aldehyde product is recovered by contacting the product solution with a primary alkanol-H₂O extraction solution to form a 2-phase mixture, and separating the catalyst and product containing phases. Recovery does not result in significant loss of catalyst components.

Palladium Complex Catalyst for Preparation of Cyanobiphenyl Derivatives

AGENCY OF IND. SCI. & TECHNOLOGY

Japanese Appl. 4/169,564

A thermally stable cyanobiphenyl is prepared by reaction of a halogenated biphenyl with a cyanide in the presence of a Pd complex catalyst and a crown ether. The catalyst preferably consists of a Pd compound, such as PdCl₂, and a phosphine, such as an aromatic phosphine, alkylphosphine or diphosphine. Cyanobiphenyl is prepared efficiently by this method.

Catalytic Production of Branched Fats from Maleic Anhydride

HENKEL KGAA.

German Appl. 4,102,500

Branched fats are produced by addition of maleic anhydride to unsaturated fatty acids, preferably oleic acid, or their lower alkyl esters, preferably methyl oleate, at 90–175°C, in the presence of Rh and/or Pt catalyst(s) present at 0.005–10 wt.% with respect to maleic anhydride. The catalyst(s) give high product yields, at low temperatures if Rh salts are used.

FUEL CELLS

Platinum Alloy Electrocatalyst for Fuel Cell Anode

STONEHART ASSOC. INC. *European Appl.* 501,930A

An electrocatalyst consists of an alloy of 10–39 at.% Pt, 30–5 at.% Ni, 30–5 at.% Co and 30–3 at.% Mn, preferably 39 at.% Pt, 26 at.% Ni, 26 at.% Co and 9 at.% Mn, on a porous inorganic oxide support such as Al₂O₃ or SiO₂, or C. The catalyst has excellent poisoning resistance with respect to CO and is especially useful for the anode of a fuel cell employing liquid natural gas as the anode gas.

New Platinum Alloy Catalysts for Phosphoric Acid Fuel Cells

STONEHART ASSOC. INC. *Japanese Appl.* 4/141,236

A new catalyst for use as a phosphoric acid fuel cell electrode consists of a C support loaded with a Pt alloy containing Au, Au and Ni, Co or Mn, with a Au content of 3–20 at.% with respect to the Pt. The catalyst is prepared by reducing Pt and Au compounds to deposit Pt and Au on the C support, adding an organic acid amine salt of Ni, Co or Mn, then heating to form the Pt alloy.

Catalytic Removal of Carbon Monoxide from the Fuel Gas for a Fuel Cell

CANADA MIN. NAT. DEFENCE

Canadian Patent 1,305,212

A low temperature acid fuel cell with a noble metal anode and a solid polymer electrolyte can be operated with a fuel gas containing CO by first reacting the CO with an O₂ containing gas at 10–16°C and a pressure of 500 psig, in a column containing a catalyst of 0.01–5 wt.% Pt, Rh or Ru on a support of Al₂O₃, SiO₂, or others. The CO is converted to CO₂ giving a fuel gas containing only 2–10 ppm CO.

Fuel Cell Electrodes Containing Platinum

CANADA MIN. NAT. DEFENCE

Canadian Patent 2,052,221

A composite electrode for use in a fuel cell consists of a conductive sheet material, preferably C fibre paper, impregnated with 2–14 wt.% of a hydrophobic polymer, preferably PTFE, deposited on which is a catalytic material of Pt and a PTFE binder. Membrane electrodes can be constructed with thin membranes to obtain maximum cell efficiency.

CORROSION PROTECTION

Corrosion Reduction Using Platinum Group Metals

GENERAL ELECTRIC CO. *U.S. Patent 5,135,709*

Reduction of the corrosion potential of steels, stainless steel, Ni- or Co-based alloy exposed to high temperature H₂O is achieved by providing a catalytic layer of a platinum group metal on the component. The coating of platinum group metal catalyses the reduction of the oxidising species and thus the amount of added reducing species needed to lower the corrosion potential of the component below a critical potential. The method is useful for reducing corrosion of components exposed to high temperature H₂O at ~150°C or above, steam or condensates, for example in H₂O deaerators, nuclear reactors and steam-driven central power generators.

Corrosion Resistant Material

MITSUBISHI HEAVY IND. CO. LTD.
Japanese Appl. 4/187,749

Corrosion resistance material which is used for an ultrasonic wave oscillator plate for pickling, consists of Ti-6Al-4V-Pd alloy including 0.01–0.17% Fe and 0.01–0.2% Pd, and is hot-rolled at 950–900°C, heated to 900–960°C, H₂O-cooled, heated to 540–600°C, and air-cooled. A strip running constantly through the pickling liquid is bolt-tightened to the oscillator plate on the body of the oscillator attached to an amplifier.

Corrosion Resistant Iron Composition for Use in Acidic Media

MAGN. MINING METAL INST. *Russian Patent 1,663,041*

An Fe composition with increased corrosion resistance for use in acidic media contains 1.6–2.8 wt.% C, 1.5–2.5 wt.% Si, 0.5–1.0 wt.% Mn, 18–35 wt.% Cr, 0.1–0.3 wt.% Ti, 0.15–0.7 wt.% Rh and balance Fe. Corrosion is reduced by Rh atoms accumulating on the surface of the Fe in the form of 0.05–0.1 μm discrete inclusions. The Fe composition is used for pumps and retorts.

ELECTRICAL AND ELECTRONIC ENGINEERING

Rare Earth Oxide Superconductor

INT. SUPERCONDUCTIVITY TECHNOLOGY CENT.
European Appl. 493,007A

A superconductor consists of oxide grains containing Y, Gd, Dy, Ho, Er or Yb; Ba; Cu; and 0.01–5 wt.% Rh and/or Pt contained in the grains. The superconductor is prepared by mixing powders of the rare earth metal, Ba and Cu with Rh and/or Pt (compound), shaping, heat treating, slow cooling, and heat treating at 650–400°C for 10–50 h in O₂. The material exhibits a very high pinning effect and an excellent critical current density in a high magnetic field.

Amorphous Soft Magnetic Material for Recording Equipment

SONY CORP. *World Appl. 92/9,091A*

An amorphous soft magnetic material contains Co, Zr, Pd, and Nb, Cr, V, Ta, W or Mo, and is preferably produced by quick-cooling a liquid or by a sputtering method. The material has a high saturation magnetic flux density, low coercive force, high permeability, and good corrosion and abrasion resistance.

Oxide Superconductor with a High Critical Current Density

HOKURIKU ELECTRIC POWER CO.
World Appl. 92/17,407

An oxide superconductor comprises a LnBa₂Cu₃O₇ crystal (where Ln is at least one of Y, Sm, Eu, Gd, Ho, Er and Yb) in which Ln₂BaCuO₅, and a Pt, Ba and Cu composite oxide of mean particulate diameter of 1–10 μm, are finely dispersed. The superconductor produced by mixing composite oxides of Ln powders, melting, cooling, and pulverising the cooled solid, followed by addition of Pt powder and moulding.

Magneto-Optical Information Storage Medium Having Palladium Substrate

U.S. DEPT. ENERGY *U.S. Patent 5,116,693*

A magneto-optical information storage medium consists of a Pd substrate with an epitaxially deposited ultrathin Fe film, which has an easy axis of magnetisation perpendicular to the plane of the Fe film. This provides a medium for data storage which is magnetically stable, non-volatile, has high density, high signal to noise ratio and is erasable, and uses an ultrathin film of magnetic material to maintain vertical magnetisation of the medium.

Thick Film Resistor Paste Composition

E. I. DU PONT DE NEMOURS & CO.
U.S. Patent 5,122,302

A thick film resistor paste having an admixture of finely divided particles consists of a conductive paste containing at least one Pt group metal oxide having a positive temperature coefficient of resistance and Co ruthenate; an inorganic binder; and a filler; all dispersed in an organic medium. The paste is used especially for temperature sensor applications, but also for gas or liquid flow sensors, surge suppressors or liquid level indicators.

Fabrication of a Bismuth-Based Superconducting Material Using Platinum Wires

UNIV. LELAND STANFORD JUNIOR
U.S. Patent 5,122,504

A ribbon of Bi-based superconducting material is fabricated by placing two parallel Pt wires along the sides of a Bi₂Sr₂CaCu₂O₈ source material, melting the top so that a liquid film is created, pulling the wires in a vertical direction to cool the melted material so that it solidifies to form a solid ribbon of superconducting material, and preferably annealing in air.

Electrically Conductive Metal Powders for Multilayer Ceramic Capacitors

E.I. DU PONT DE NEMOURS & CO

U.S. Patent 5,126,915

Electrically conductive metal powders consist of finely divided particles of Pt, Pd, Au, Ag, Cu, Ni, mixtures and alloys of these with a coating of a refractory metal oxide which is insoluble in the electroconductive metal and non-reducing in its presence, for example hydrous Al_2O_3 or an oxide of Mn, Ti or Pb. The electroconductive metal is preferably Pd, Ag or a Pd-Ag alloy. The metal powders are claimed for use in the manufacture of multilayer ceramic capacitors.

Deposition of Platinum Catalyst Patterns for Printed Circuit Board Manufacture

GENERAL MOTORS CORP.

U.S. Patent 5,139,818

A method for applying catalytically active metal clusters to a ceramic substrate, particularly Al_2O_3 , involves depositing a film of solution containing tris(1,2-diaminopropane)Pt(IV) 2-ethylhexanoate in xylene onto the substrate, selectively irradiating, rinsing with xylene to remove the soluble Pt compound, and pyrolysing in the presence of O_2 at 300–1000°C for up to 5 min. The catalytically active metal clusters catalyse localised electroless deposition of Cu, (or Pd-Sn).

Photomagnetic Recording Layer Containing Noble Metal Layers

HITACHI LTD.

Japanese Appl. 4/132,030

A photomagnetic recording layer is composed of reciprocal layers of noble metal and transition metal alloy where the noble metal layer is Pt, Pd, Rh or Au, and the other layer is mainly Fe or Co containing Pt, Pd, Rh, Au, Nb, Ti, Ta or Cr. In an example layers of Co_{99}Nb , and Pt were reciprocally laminated on a plastic substrate by sputtering. The recording layer has enhanced vertical magnetic anisotropy, reduced saturated magnetisation, enhanced coercivity, and improved recording fidelity.

Improved Life Magneto-Optical Recording Medium

DAICEL CHEM. IND. LTD. *Japanese Appl.* 4/137,238

A magneto-optical recording medium with improved running life has a recording layer consisting of a reciprocal laminated Pd-Co group artificial lattice film and/or a reciprocal laminated Pt-Co artificial lattice film on a transparent substrate.

Improved Quality Photomagnetic Recording Medium

SEIKO EPSON CORP.

Japanese Appl. 4/143,947

A photomagnetic recording medium consists of a substrate and a recording layer composed of alloy layers containing at least one of Gd, Tb and Dy, and at least one of Pt, Pd and Co; preferably PtGdCo alloys containing 5–60 at.% Gd are used. The saturated magnetisation of the recording layer can be reduced, and thus the quality of the photomagnetic recording medium is improved.

Antiferromagnetic Thin Layer with Improved Corrosion Resistance

HITACHI LTD.

Japanese Appl. 4/162,207

An antiferromagnetic thin layer consisting of an Fe-Mn-Ir alloy gives a diamagnetic thin layer having a high bias magnetic field and improved corrosion resistance. When Pt, Rh or Ru is added to Fe-Mn-Ir the corrosion resistance and magnetic field are further improved. The antiferromagnetic thin layer can be used for a magnetic resistance effect element.

Photomagnetic Recording Medium with Cobalt and Platinum Layers

SONY CORP.

Japanese Appl. 4/167,406

A photomagnetic recording medium consists of a recording layer having alternately laminated artificial lattice magnetic films consisting of Co and Pt layers, with the artificial lattice magnetic films multilayered through transparent dielectric layers. The photomagnetic recording medium has good thickness and a good rectangular-loop ratio, and is used for recording and play-back of information.

Bismuth System Superconducting Material Containing Platinum Fine Powder

SUMITOMO ELECTRIC CO. *Japanese Appl.* 4/170,321

A Bi system superconducting material is based on Bi or (Bi,Pb)-Sr-Ca-Cu, added to which is 0.05–0.4 wt.% of fine Pt powder of average grain diameter up to 2 μm . The material is also used in the production of superconducting line which involves coating this material with a metal coating material, and then effecting plastic treatment and thermal treatment at least once. The material and superconducting line have high critical current density and critical current.

Composition Containing Ruthenium for Use in Thick Film Resistors

SUMITOMO METAL MINING CO.

Japanese Appl. 4/181,701

A composition for use in a thick film resistor consists of a Ru compound conductive powder containing Ru; Ba, Sr, Ca, La, Ce, Pr or others; Zr, Ti, Hf, Nb or Ta; and O, together with a non-reducing glass frit and a vehicle. The Ru conductive powder is present at 15–75 wt.% of the powder and glass frit. The composition is stable in a non-oxidising atmosphere, has a good temperature coefficient of resistance, and is used in a thick film resistor for a hybrid IC circuit or chip resistor, and may be used with Cu conductors.

Baseplate for a Thin Film Device

NEC CORP.

Japanese Appl. 4/182,393

A baseplate for a functional thin film device consists of a ferroelectric epitaxial film formed over an epitaxial electroconductive oxide film of IrO_2 , OsO_2 , RuO_2 or ReO_3 , on a monocrystalline Si baseplate. This structure, where the electroconductive oxide film has a refractive index lower than that of the ferroelectric film, provides a light waveguide, permitting its use as an optical switch.

Photomagnetic Recording Medium

HITACHI LTD. *Japanese Appl.* 4/186,545

The structure of over-writable photomagnetic recording medium for high density recording consists of two layers of different magnetically bound characters. One layer is made of an alloy based on at least one of Dy, Tb, Ho or Gd, and at least one of Fe or Co. The other layer is a reciprocal laminate of at least one platinum group metal of Pt, Pd or Rh, and at least one of Fe or Co. It can be written-read or erased by a laser beam, and it has an improved corrosion resistance.

Opto-Magnetic Recording Films

HITACHI LTD. *Japanese Appl.* 4/186,706-7

A film structure for opto-magnetic recording consists of a laminated film layer containing Pt, Pd, Rh and Au, and a layer based on Fe, Ni and Co with other elements; the layers above are laminated in turn to make a multilayered structure. The rare earth elements in the ferromagnetic layer and the alloy layer based on Fe group elements may provide a dominant sub-lattice magnetisation. This allows more stable storage of the written information.

Platinum or Palladium Multiplex Optical Magnetic Storage Device

SEIKO EPSON CORP. *Japanese Appl.* 4/186,708

A multiplex optical magnetic storage device consists of four successively applied layers: (1) a Co base layer, (2) and (4) layers containing a platinum group metal, preferably Pt and/or Pd, and (3) a layer made of a rare earth metal with at least one of Gd, Tb and Dy. The four layers can be repeatedly applied on glass, plastics or crystal by vacuum vapour deposition, sputtering or molecular beam epitaxy, to form a highly multiplexed board.

Palladium Containing Conductor Paste for Variable Resistor Electrode

TANAKA MASSEI K.K. *Japanese Appl.* 4/192,208

The conductor paste comprises Ag- or Pd-powders, in ratio 79:21-91:9, respectively, in an inorganic binder and dispersed in an organic vehicle, the binder comprises a mixture of Bi oxide and glass frit. The prepared paste can be printed on a ceramic substrate of 96% Al₂O₃, then sintered twice at 850°C for 10 min, to make a conductive film of 8-12 Å thick. The conductor paste is used for forming electrodes for a thick film variable resistor.

Improved Smoothness Oxide Superconducting Thin Membrane

SUMITOMO ELECTRIC CO. *Japanese Appl.* 4/193,702

A superconducting membrane consists of superconducting oxide layers and noble metal layers laminated alternately on a substrate, with the layer contacting the substrate and the uppermost layer consisting of the superconductor oxide. The oxide superconducting membrane has improved smoothness, improved superconducting characteristics, and is used for superconducting electronic devices.

Resistor Film Production for Hybrid IC

FUJI XEROX CO. LTD. *Japanese Appls.* 4/279,002-3 and 4/279,005

A resistor film forming material contains (a) an organic Ir compound, and (b) a compound of at least one additional element (M) selected from Si, Bi, Pb, Sn, Al, B, Ti, Zr, C or Ba, with atomic ratio M:Ir = 2.5-7. The compounds (a) and (b) can be carboxylate complexes, diketone type chelate, alkoxide or mercaptide compounds of Ir or M. The chosen solvent for the film forming material can dissolve metal or non-metallic organic compounds. Resistor film for hybrid IC and thermal heads contains particles of up to 100 Å diameter of a platinum group metal oxide, and (b). The resistor film has a uniform resistance value.

TEMPERATURE MEASUREMENT

Cryogenic Temperature Measurement Apparatus

TOSHIBA K. K. *European Appl.* 510,880

A cryogenic temperature apparatus uses two circuits with Pt and C glass resistance sensors in cryogenic temperature cooling cryostats connected to a common analogue to digital converter and a CPU for processing for output. The first circuit is to measure 300-30 K and second for 30-4 K. Each circuit has a constant current source supplying DC current to a cryogenic temperature cooling cryostat to generate a voltage, which is amplified to a specified signal level.

Improved Temperature Sensor with High Flexural Strength

MURATA MFG. CO. LTD. *Japanese Appl.* 4/265,828

The sensor consists of an insulating base plate, covered by a Pt film. The ZrO₂ base plate 0.15-0.3 mm thick is covered by SiO₂ or Al₂O₃ layers, preferable 1000-5000 Å thick. The Pt film of thickness 1-2 μm is produced by printing, sputtering and deposition. The adhesion of the Pt film and the insulating base plate is greatly improved. The flexural strength and temperature coefficient of resistance are high.

MEDICAL USES

New *trans*-Platinum (IV) Compounds for Treatment of Cancer

JOHNSON MATTHEY P.L.C. *European Appl.* 503,830A

New *trans*-Pt(IV) compounds of formula Pt(X)₂(Y)₂L₁L₂ where L₁ and L₂ are amines, but L₁ and L₂ can not be NH₃, simultaneously in mutually *trans* co-ordination sites; X and Y are halogens, OH, carboxylates, or (Y)₂ is dicarboxylate; (X)₂ and (Y)₂ are dicarboxylate, are prepared. The compound is active against cancer cells, particularly against cis-platin-resistant cell lines. Daily dose for humans is 0.1-100 mg/kg of body weight, used either alone or in combination with another chemotherapeutic agent.

Compositions Containing Osmium for Treatment of Bacterial or Fungal Infection

JOHNSON MATTHEY P.L.C. *World Appl.* 92/10,177A

Compositions having anti-bacterial and anti-fungal activity and used in the treatment of infection contain Os in the 4-6 oxidation state; oxo, thio, substituted imido or phosphido groups; and alkyl, aryl, phosphine or N-based groups; in admixture or association with a diluent. The Os complexes have low solubility in water, but as it is preferably administered in solubilised form a solubiliser, preferably cyclodextrin, especially β -cyclodextrin, is used.

Liposome Preparations Containing Platinum Complexes for Cancer Treatment

SUMITOMO SEIYAKU K.K.

Japanese Appls. 4/169,531-32

Liposome preparations used for the treatment of cancers contain a lipid-soluble Pt complex, phospholipids and optionally unsaturated fatty acids or their esters. In examples, such preparations contain cyclohexane-1,2-diamine Pt(II) dimyristoate, lecithin and optionally cholesterol. The liposome preparation causes less severe renal toxicity than the regular cisplatin preparation.

New Anti-Neoplastic Agents of Platinum Supported on Calcium Ceramics

SANGI K.K.

Japanese Appl. 4/178,330

A substance showing excellent anti-neoplastic activity consists of 0.001-30 wt.% Pt supported on Ca ceramics of tricalcium phosphate, Ca monohydrogen phosphate or Ca carbonate. The anti-neoplastic agent can be produced easily and stably, has anti-neoplastic activity equivalent to that of cisplatin, and has low toxicity - in rats LD50 is above 2000 mg/kg orally.

New Platinum Complexes with Anti-Tumour Action

HOKKO CHEM. IND. CO. LTD.

Japanese Appl. 4/178,396

New Pt(IV) complexes including halogen atoms, cycloalkyl groups and lower alkylcarbonyl groups are useful as anti-tumour agents effective in the treatment of testicular cancer, bladder cancer, ovarian cancer and other cancers. The complexes have no real toxicity, acute toxicity is low, the therapeutic index is high, and they may be administered orally at a daily dose of 400-800 mg/m³ or parenterally at 100-400 mg/m³.

Agent Containing Ruthenium Red for Treating Heart Disease

OTSUKA PHARM. CO. LTD. *Japanese Appl.* 4/182,432

A new Ca ion dependent cyclic nucleoside phosphodiesterase inhibiting agent has Ru red as the effective substance. The agent is used for the treatment of ischaemic heart diseases such as angina pectoris and myocardial infarction, pulmonary hypertension, vertigo and others, and can be administered orally or parenterally at a daily dose of 0.1-300 mg/kg.

Palladium Core for Catheter

TERUMO CORP.

Japanese Appl. 4/187,160

Core material for a catheter guide wire comprises a flexible top end part made of shape memory TiPd alloy, which has a high flexibility, and a base part. The alloy preferable containing 45.0-51.0 at.% Pd and balance Ti, with 1.0-30.0 at.% Pd being replaced with at least one of V, Cr, Mn, Ni, Fe, Co or Cu. The synthetic resin includes polyethylene, PVC and polyester.

Titanium-Palladium Alloy Core Material for Catheter Guide Wire

TERUMO CORP.

Japanese Appl. 4/187,160

A catheter guide wire is obtained by coating a core material with a synthetic resin where the core material consists of a top end part with high flexibility and a base part. The top end part is made of a shape memory TiPd type alloy preferably containing 45.0-51.0 at.% Pd and balance Ti, with 1.0-30.0 at.% Pd replaced with at least one of V, Cr, Mn, Ni, Fe, Co or Cu.

New Anti-Cancer Platinum-Crown Ether Complexes with Lower Toxicity

B.K. KEPPLER

German Appl. 4,041,353

New Pt complexes with crown ether carboxylic acid compounds, for example 18-crown-6-tetracarboxybis(diammino Pt(II)), are used in the treatment of cancer. The complexes have tumour inhibiting properties at least as good as cisplatin, are less toxic, more water soluble, and can be given parenterally or orally at 0.1-5 mg/day.

Catheter for Epidural Pain Relief

R. XAVIER

Canadian Patent 2,034,580

A catheter for epidural pain relief has at least two Pt or Ag ring electrodes spaced from the distal end and electrically insulated from one another, a wire connected to each electrode, and a pulse generator for applying pain relief pulses via the electrodes. The catheter can provide effective and satisfactory relief from severe pain either temporarily or permanently.

Palladium Alloy for Dental Implant Restorations

S. P. SCHAFFER

Canadian Patent 2,043,429

Pd-based alloy consists of (by wt.%) 50-90 Pd, 0-3 Pt, 0-37 Au, 0.5-8 Ga, 0.8 In, 0-8 Sn and up to 2 % of a grain refiner selected from Ru, Re and In, or their mixtures. The alloys give good biocompatibility and inertness, do not form galvanic couples with other metals, and have a solidus temperature at > 1100°C, which allows sufficient temperature between the firing temperature of dental porcelain and the onset of melting of the alloy, to allow soldering.

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