

NEW PATENTS

METALS AND ALLOYS

Gold Coloured Alloy with Low Gold Content

D. DAVITZ

U.S. Patent 4,948,557

A gold coloured alloy composition contains 24–27 wt. % Pd, 17–22 wt. % In, 5–30 wt. % Cu, 1–20 wt. % Au and balance Ag, and may contain 0.25–1 wt. % Ru. The alloy is tarnish and corrosion resistant, and gives a rich gold colour at a reduced cost due to its reduced Au content. The novel alloy can be made into articles of jewellery, and is used in dentistry for crowns and bridges.

Oxidation Resistant Amorphous Alloy Thin Films

MITSUI PETROCHEM. IND. K.K.

Japanese Appl. 2/107,748–49

Amorphous alloy thin films contain Pt, Pd, at least one each of the light and heavy rare earth elements, and Fe and/or Co. The films have excellent oxidation resistance, with a direction of easy magnetisation vertical to the film surface.

ELECTROCHEMISTRY

Oxygen Generating Electrode

M. MUROYA

Japanese Appl. 2/77,394

An O₂ generating electrode consists of a Ti base material with a coating of at least one oxide of IrO₂ or RuO₂, on top of which is an Mn oxide layer. The IrO₂ and/or RuO₂ layer promotes the O₂ generating reaction on the Mn oxide layer, prevents the Ti base material dissolving, and attaches the Mn oxide. The electrode gives good O₂ generating efficiency, is used for electromagnetic propulsion vessels, and generates less chlorine.

Electrode for Electrolysis of Brine

LIMES K.K.

Japanese Appl. 2/88,785

An electrode for electrolysis consists of a metal substrate with a surface amorphous alloy layer having at least one Fe group element, at least one Pt group element, and at least one of Ti, Zr, Nb and Ta. The alloy layer is made by an ion-beam mixing method, and then treated with an acid. An electrode material having an irregular surface is produced.

Water-Repellant Electrode for Electrolytic Processes

N. E. CHEMTECH K.K.

Japanese Appl. 2/145,788

An electrode consists of an electroconductive metal base coated with a film of oxide of Pd, Rh, Ir or Ru, with metals Pd and Rh, and a water-repellant layer such as polytetrafluoroethylene. The electrode is used extensively for industrial electrolysis, electrolytic synthesis, and electroplating processes.

Durable Electrode for Electrolysis of Seawater

ISHIFUKU METAL IND. K.K.

Japanese Appl. 2/190,491

A Ti (alloy) based electrode has an intermediate layer with 0–20 mol% of at least one of the oxides of Ir, Mn, Co, Sn and Sb, and 80–100 mol% of oxides of Nb, Ta and/or Zr, dispersed in Pt; and an outer layer of mixed metal oxides including 5–95 mol% of Ir oxides. The electrode has low O₂ overvoltage, excellent durability, and is used for electrolysis of seawater, surface treatment of metals, forming metal foils, and recovering metals.

Durable Electrode for Electrolysis Containing Platinum and Iridium

ISHIFUKU KINZOKU KO.

Japanese Appl. 2/200,790

An electrode has a substrate, an intermediate layer consisting of a partial coating of dispersed Pt and a partial oxide coating which may contain Ir oxide, and an outer layer having 1–30 mol% Pt, 5–94 mol% Ir oxide, and 5–94 mol% of oxides of Nb, Ta and/or Zr. The electrode has low O₂ overvoltage, low film resistance of the intermediate layer, good durability, and is used as an anode in electrolysis of sea water, and surface treatment of metals.

Activating a Titanium Anode for Electrochemical Processes

VEB. CHEM. BITTERFELD

East German Patent 273,364

A Ti anode is activated by anodising in an electrolyte containing sealing components, fluoride, and 0.01–2.0 mol/l RuCl₄. Oxidising is by spark discharge under a direct voltage of 10–200 V, followed by optional treatment with a solution of Pt group metal chlorides and tempering. Anodes with high electrical conductivity and stability are produced economically, for use in electrochemical processes, especially chloralkali electrolysis.

ELECTRODEPOSITION AND SURFACE COATINGS

Palladium Electroplating Baths

AT. & T. BELL LAB.

U.S. Patents 4,911,798–99

Electroplating of Pd or Pd alloys uses baths with conductivity >0.001 mho-cm and pH >5, and containing (a) a Pd source, and alkyl ammonium chloride surfactant with 4–35C, and a specified brightener, or (b) Pd with alloying metals such as Pt, Rh, Ir, Ru, Au, Ag, Cu, Ni and Co, an alkylhydroxyamine, and a phosphate buffer system. The plated films thus obtained have (a) excellent adhesion and ductility, are crack-free, and are used for electrical contacts, or (b) corrosion resistance with high electrical conductivity, with use for connector pins.

Electroplating Non-Conductive Articles

SHIPLEY CO.

U.S. Patent 4,919,768

A non-conductive body is electroplated by treating the surface in sequence with (a) at least 0.01M Sn^{2+} salt solution, (b) 0.00001–1.0M sulphide solution, and (c) 0.001–0.01M Pt or Pd salt solution, and electroplating the surface with Cu or solder. Deposition of a sulphide film allows direct electroplating without an electroless plating step. The plated article is a printed circuit board.

Coating Metallic Substrates to Increase Erosion Resistance

AVCO CORP.

U.S. Patent 4,931,152

Erosion resistance is imparted to a metallic substrate by coating with 0.1–1.5 mil Pt or Pd, 0.5–1.5 mil W, and 0.2–3 mil WC alloy or V matrix material having dispersed WC phases. The first layer retains substrate integrity and acts as a diffusion barrier. The method is used for (stainless) steels, and gives increased erosion resistance without loss of fatigue life.

Palladium-Nickel Film Formed by Jet-Plating

FUJITSU LTD.

Japanese Appl. 2/133,595

A Pd film containing Ni is formed by jet-plating, using a plating solution containing 20–30 g/l Pd and 1–10 g/l Ni. The method provides Pd films having good appearance for ornamental uses and also those having good electrical properties. In an example, a 0.75–1 μm thick Pd film containing up to 20 wt.% Ni was formed on a substrate.

Palladium Plating Solution

KURARAY K.K.

Japanese Appl. 2/153,077

An electric insulator is chemically plated using a solution of a Pd-urea complex salt and a reducing agent, followed by electroplating in the same solution. The method is used for Pd deposition on a specified portion of various shaped electric insulators, for example on a teeth restoration body.

Palladium Activating Solution for Electroless Plating

KANEHIRO METALLISIN.

Japanese Appl. 2/166,711

A capacitor element is made by adding an activating solution of Pd chloride and Sn chloride to a resist, applying the resist to a ceramic substrate by screen printing, followed by electroless plating. The method is used for chip type multilayer ceramic capacitors, chip type electrolytic and other ceramic capacitors.

Plating Non-Electroconductive Objects

UEMURA KOGYO K.K.

Japanese Appl. 2/175,895

Non-conductive objects are plated by coating with metallic Pd or Ag nuclei, immersing in a plating bath containing a Cu salt, a Ni salt and a reducing agent, electroplating at low current density to form a film with ≥ 80 wt.% Cu, and electroplating at high current density to obtain a film with > 30 wt.% Ni.

APPARATUS AND TECHNIQUE

Preparation of Labeled Biologically Active Compounds

AS. USSR MOL. GENETIC *British Appl. 2,229,718A*

A biologically active compound labelled with a H isotope is prepared by interacting a starting compound, an inorganic vehicle and a Pt group metal catalyst with an isotope of H at 373–523 K, cooling, and isolating the product. The starting compound may be a complex of a Pt group metal with amines, sugars, or others. Increased incorporation of the isotope label can be obtained, and the products can be used in medical and biological studies.

Thin Film Sensor with Platinum Layer

HONEYWELL INC.

European Appl. 375,399A

A thin film sensor consists of a layer of Si_3N_4 , a 20–100 Å thick metal oxide adhesion-promoter layer, and a Pt layer; where the Pt and metal oxide layers are formed by sputtering. The oxide layer provides an atomically smooth adhesive layer between the nitride and Pt layers. The sensor is used in the manufacture of microbridge mass air flow sensors.

Biosensor Module Including a Platinum Anode

AVL. MEDI. INSTR. A.G.

European Appl. 385,964A

A sensor module for determination of a substrate concentration, for example glucose concentration in a perfusion solution, has an amperometric enzyme electrode in a holder with a central Pt anode, contacted by an enzyme membrane with an outer membrane; and a reference electrode. The biosensor is a simple module of streamlined shape with a compact design.

Oxygen Sensing Device with Platinum Electrodes

NAT. AERO & SPACE ADMIN.

U.S. Patent 4,911,890

A device for rapidly sensing the amount of molecular O_2 in a combustion product gas contains a heated ceramic electrolyte disc coated with Pt electrodes. This serves as a shared wall between the product gas and reference air, generating a voltage output proportional to the partial pressure difference of O_2 . The amount of O_2 in the combustion gas is controlled to maximise efficiency and minimise pollution.

Iridium Crucible for Gallium Garnet Single Crystal Production

SHINETSU CHEM. IND. K.K.

Japanese Appls. 60/5,094 and 2/175,685

In the manufacture of a Ga garnet single crystal by the Czochralski method, the raw materials Ga_2O_3 and rare earth metal oxides such as Gd_2O_3 are melted by heating in an Ir crucible, in an atmosphere with O_2 partial pressure of 20–100 mm Hg. A single crystal of Ga garnet at least 75 mm in diameter is pulled during or after the melting period, which has less defects and is useful for magnetic bubble memories or working substances for a magnetic refrigerator.

Electrolytically Polished Platinum Probe for Microscopy

AGENCY OF IND. SCI. TECH.

Japanese Appl. 2/138,499

A Pt material containing 99.9% or more of Pt, 0.005% or less of Cu, and balance impurities such as Pd, Au, Ag, Mg, Mn, Fe and Zn, has a controlled crystallite grain size of 10–200 μ m diameter. The material is electrolytically polished to provide a Pt probe for the Scanning Tunnel Microscope (STM).

Oxygen Sensor with Improved Durability Against Sulphur Dioxide

FUJIKURA CABLE WORKS K.K.

Japanese Appl. 2/145,960

A ceramic O₂ sensor consists of an ion conductive ceramic base plate, Pt electrodes, and porous thin film layers covering these electrodes. In an example Pt powder and stabilised ZrO₂ powder were mixed to prepare the porous thin film layers, which can also include Pd, Rh, Ir, Os or Ru in place of the Pt powder. The sensor has better durability against SO₂, thus allowing direct insertion into a combustion site.

Composite Electrode with Platinum Layers for Oxygen Sensor

RIKEN CORP.

Japanese Appl. 2/210,254

A composite electrode consists of an element substrate made of a solid electrolyte with vapour coated Pt layers 0.01–1 μ m thick on both sides, and Pt paste layers having particle diameter 0.05–10 μ m printed on the surface of the Pt layer. The composite electrode has improved adhesion to the solid electrolyte substrate, and it is used for a critical electric current-type O₂ gas sensor.

JOINING

Palladium Layer Used in Soldering Semiconductor Contacts

IBM CORP.

European Appl. 374,475A

A 20–150 nm thick Pd layer in contact with a layer of Cu or solder is used in a fusion joining operation or as a dressing element for solder removal from a contact pad. The Pd operates in a reducing atmosphere to increase fusion at a low temperature in the total absence of flux. The method is used for repeated solder joining of devices without using a flux, in semiconductor contact technologies.

Alloy Solder for Bonding Precious Metal

HIRAI NECKLACE KOGY

Japanese Appl. 2/92,491

A Sn-Cu-Zn base alloy for butt-welding precious metal in air consists of 15–20 wt.% Sn, 25–40 wt.% Zn, 2.5–10 wt.% Ag, 0.5–5 wt.% Au and/or 0.5–2 wt.% Pd, 0.1–2 wt.% B and/or 0.1–1 wt.% P, and balance Cu. The solder is used for butt-welding chains and rings in air at a low temperature of 1100–1250°C, and the product is less amenable to crack generation when subjected to cold working.

HETEROGENEOUS CATALYSIS

Three-Way Catalyst Containing Germanium Oxide

N. E. CHEMCAT. CORP.

European Appl. 377,468A

An exhaust gas purification catalyst consists of 0.1–10 g/l Pt, 0.02–2 g/l Rh, 30–200 g/l active Al₂O₃, 10–150 g/l CeO₂, and 1–50 g/l GeO₂ on a monolithic support. The catalyst is useful for removing CO, hydrocarbons and NOx from exhaust gas, and also suppresses the formation of H₂S.

Saccharose Tricarboxylic Acid Salt Production

HOECHST A. G.

European Appl. 378,127A

Production of saccharose tricarboxylic acid salts is by reaction of saccharose with O₃ in aqueous medium in the presence of a 5–10 wt.% Pt on active C catalyst, with stepwise heating of the starting materials to 70–80°C. The saccharose tricarboxylic acid products are useful as builders in washing powders, for example as a replacement for phosphate builders; as additives to food products, and crosslinkers in lacquer compositions.

Platinum Catalyst for Aromatic Alcohol Production

MITSUBISHI PETROCH. K.K.

European Appl. 378,165A

Aromatic alcohols are produced by reducing aromatic hydroperoxides with H₂ in a liquid phase, at 20–120°C, using a catalyst of Pt, or Pt and at least one of Pb, Sn, Cu, As, Sb, In, Se and Bi, supported on Al₂O₃, in a fixed bed reactor. The Pt catalyst has high and stable activity even during long periods of use. The products are useful as intermediates for various types of organic compounds, and as solvents.

Platinum Dehydrogenation Catalyst to Enhance Aromaticity

SHELL INT. RES. Mij. B.V.

European Appl. 383,395A

A dehydrogenation catalyst containing a Group VIII noble metal, a Group IVA metal and a refractory oxide support—especially Pt, Sn and an Al₂O₃ support—is used to enhance the aromaticity of a high viscosity index lubricating base oil feedstock. This can be followed by hydrotreating using a catalyst of Ni and/or Co and Mo and/or W. The aromaticity of the oil is increased, while maintaining the high viscosity index.

Spark Plug with Platinum-Containing High Voltage Electrode

J. A. MCDUGAL

European Appl. 386,941A

A spark plug consists of high voltage and ground electrodes separated by an insulator, with a concentrically disposed electrically conducting winding. The high voltage electrode includes W based and Pt based layers of cermet ink, forming the elongated portion and exposed portions of the electrode; the Pt based layer being more resistant to corrosion. The spark plug has an increased spark size, which results in a larger flame kernel.

Novel Isomerisation Catalyst Containing Platinum

TEIJIN PETROCH. IND. *European Appl.* 390,058A

An isomerisation catalyst consists of a crystalline aluminosilicate zeolite with an alkali metal cation in at least 50% of the cation sites, and a refractory inorganic oxide supporting Pt, and Sn and/or In. The novel catalyst can be used with another catalyst in the isomerisation of xylenes to give a specific product such as *p*-xylene, and can decompose the small amount of non-aromatic hydrocarbons normally present in the feedstock.

Fischer-Tropsch Catalyst with Increased Activity

DEN NORSKE STATS OL. *World Appl.* 90/7,377A

A Fischer-Tropsch catalyst for converting syngas to hydrocarbons consists of Co on an Al₂O₃ support, with the additional presence of Pt, Rh and/or Ir in an amount less than the Co. The added metals give a significant increase in syngas conversion activity, even in the absence of added metal promoters, and an increased liquid hydrocarbon yield is obtained with no increase in methane or oxygenate production.

Rhodium Hydrogenation Catalyst for Preparation of Tetracyclines

HOUBA INC. *World Appl.* 90/7,492A

α -6-Deoxytetracyclines are prepared by hydrogenation of a selected substrate such as a methylene tetracycline, an ethylene tetracycline or their salts, in the presence of a SiO₂ supported heterogeneous Rh catalyst. The products are useful in the production of the antibiotic deoxycycline (α -6-deoxy-5-oxytetracycline). The alpha epimers are stereospecifically produced at higher yields, using lower levels of Rh metal than prior methods.

Palladium Catalyst for Preparation of Cinnamates

MALLINCKRODT INC. *World Appl.* 90/10,617A

Cinnamates such as 2-ethylhexyl-*p*-methoxycinnamate are prepared by reacting an iodobenzene compound with an acrylate ester, in the presence of a trialkylamine and a catalyst consisting of Pd on a C support. The process uses iodide compounds which can be recovered and recycled, and result in faster, cleaner reactions. The product cinnamates are used as sunblocking agents.

Catalytic Purification of Isophthalic Acid

AMOCO CORP. *U.S. Patent* 4,933,492

Crude isophthalic acid is purified by hydrogenation of the impurities at 100–300°C using a catalyst consisting of at least two of Pt, Pd, Rh, Ir, Os and Ru supported on active C particles at 0.01–2 wt.%. A uniform catalyst bed or layers each having one metal component can be used. The method is useful for purification of isophthalic acid from liquid phase oxidation of *m*-xylene; the product is useful for manufacture of unsaturated polyesters.

Preparation of 3-Picoline by Catalytic Hydrogenation

DU PONT DE NEMOURS CO. *U.S. Patent* 4,935,521

A catalyst consisting of Pt or Pd metal on a solid support is used in the preparation of 3-picoline by reacting 2-methylglutaronitrile with H₂, in the vapour phase at 225–325°C. The process involves recycling the separated by-products to increase the yield of 3-picoline, and makes the production more commercially viable. 3-Picoline is an intermediate for niacin, one of the B vitamins.

Palladium Catalyst for Preparation of Aldehydes from Cyanohydrins

ALLIED-SIGNAL INC. *U.S. Patent* 4,939,304

Continuous and selective conversion of a cyanohydrin to the corresponding aldehyde involves contacting an acidic solution of the cyanohydrin with a catalyst of zero-valent Pd dispersed on a porous solid organic polymeric resin, in the presence of H₂, at 10–450 psig and 10–50°C. The catalyst shows higher activity and selectivity, has good physical and chemical stability, and is resistant to deactivation.

Platinum Catalyst for Carbon Monoxide Oxidation

PHILLIPS PETROLEUM CO. *U.S. Patent* 4,940,686

An oxidation catalyst is prepared by impregnating a V₂O₅ or V₅O₅ support with an aqueous acid solution containing Pt and Fe compounds, drying, calcining at 300–700°C, and reducing under H₂ at 150–350°C. The catalyst can be coated on a porous ceramic monolith. It is used to catalyse the oxidation of CO with O₂ at 10–30°C, particularly in CO₂ lasers, exhaust gases, breathing masks, air or tobacco smoke.

Palladium Catalyst for Selective Hydrogenation of Impurities

BEIJING RES. INST. CH. *U.S. Patent* 4,940,687

A catalyst for selective hydrogenation of acetylenic and/or dienic impurities consists of 0.1–1 wt.% Pd on an Al₂O₃ support where the support is α -Al₂O₃, calcined at 1150–1400°C, having specified pore properties. The catalyst can be used for selectively hydrogenating methylacetylene and propadiene impurities in a propylene stream obtained by hydrocarbon cracking, and can be used at high inlet temperatures in a single stage.

Fischer-Tropsch Synthesis Using Modified Ruthenium Catalyst

UOP *U.S. Patent* 4,945,116

A catalyst used in the production of C₃₊ hydrocarbons from CO and H₂ and/or H₂O consists of an inorganic oxide support, 0.3–6 wt.% Ru present as 40–60 Å particles, and 0.1–5 wt.% Al, Si, Pb, As or Bi as a modifier, particularly Si, which is in active contact with the Ru. The catalysts have improved stability and can be used for conversion of coal, peat or other heavy hydrocarbons into high quality liquid fuels such as gasoline or diesel fuel.

Catalytic Conversion of Paraffins to Aromatic Hydrocarbons

AMOCO CORP.

U.S. Patents 4,946,812-13
and 4,950,828

Catalyst systems for converting light paraffins to aromatic hydrocarbons consist of (a) 0.01-10 wt.% of a Pt metal component, preferably Pt, (b) 0.1-10 wt.% of a Cl component, (c) optionally a Ga component, Cu or Au, and (d) a gallosilicate or borosilicate molecular sieve, optionally dispersed in an inorganic oxide. The catalysts are used in the upgrading of 2-5C light paraffins to aromatics such as benzene, toluene, and xylenes which are used as high octane components for gasoline and chemical feedstocks; while production of methane, ethane and heavy aromatics are minimised.

Multi-Use Carbon Monoxide Oxidation Catalyst

PHILLIPS PETROLEUM CO.

U.S. Patent 4,956,330

An oxidation catalyst consisting of a TiO₂ support impregnated with 0.1-10% Pt, 0.05-2.0% Fe, and 0.1-5% alkali metal, is activated by treating with a reducing gas. The catalyst oxidises CO to CO₂ in the presence of free O₂ at 10-50°C, and is used in breathing masks, to eliminate CO from tobacco smoke, in CO₂ lasers to recombine CO and O₂, for engine exhaust gases.

Platinum Catalyst for Isomerisation of Alkyl Aromatic Compounds

UOP

U.S. Patent 4,957,891

An isomerisation catalyst consists of at least one Pt group metal, preferably 0.1-5 wt.% Pt, and a pentasil zeolite with 0.1-10 wt.% substituted Ga, in a ZrO₂-Al₂O₃ matrix containing 1-10 wt.% ZrO₂, and may also contain 0.05-0.5 wt.% S. The catalyst is used for the isomerisation of a non-equilibrium C₈ aromatic mixture containing xylenes and ethyl benzene, and isomerisation takes place with minimal loss of alkyl aromatic hydrocarbons.

Hydrogenation Catalyst for Preparation of Alicyclic Diamines

NIPPON OXOCOHOL K.K.

Japanese Appl. 2/129,152

Alicyclic diamines are prepared by catalytic hydrogenation of aromatic diamines at 100-230°C in the presence of a supported Pd-Ru catalyst having a Pd:Ru ratio of 0.001-2:1. Catalyst deterioration is avoided by inclusion of Pd, and the products are prepared more economically than by prior art.

Catalyst for Oxygen-Hydrogen Recombination

HITACHI K.K.

Japanese Appl. 2/137,703

A catalyst for recombining O₂ and H₂ consists of Pt or Pd supported by a metal or ceramic Al₂O₃ base, and is laminated with each layer having a different mesh. The catalyst is positioned at the inlet or outlet nozzle of a heat exchanger with O₂/H₂ gas flow. The recombiner is compact and has high efficiency.

Particulates Collecting-Cleaning Filter for Diesel Engine Exhaust

TOYOTA JIDOSHA K.K.

Japanese Appl. 2/149,308

A cleaning filter has a catalyst consisting of 0.5-5.0 g/l of at least one of Pt, Pd and Rh, and 0.05-0.5 mol/l of a Mo oxide supported on a ceramic filter base material. The filter is used for removing particulates contained in exhaust gas from diesel engines. Catalyst durability is improved by the Pt group element, and initiation and ignition properties are improved by the Mo oxide.

Production of Aromatic Carboxylic Acids

OSAKA GAS K.K.

Japanese Appl. 2/157,245

Aromatic carboxylic acids are produced by reacting an aromatic sulphonyl halide and a fatty acid metal salt or metal alkoxide with CO in the presence of a Pd catalyst such as Pd/C, Pd black, (Ph₃P)₂PdCl₂, and so on. A carboxy or alkoxy carbonyl group can be introduced into an optional position of an aromatic ring in high yield. The products are useful as intermediates for plastic monomers, functional pigments, liquid crystals, drugs and agrochemicals.

Palladium Catalyst for Preparation of Indanones

BABCOCK-HITACHI K.K.

Japanese Appl. 2/164,838

Indanones are prepared by oxidation of indene or alkyl indene at 30-80°C in the presence of an oxidising agent, an organic solvent, water, and a supported catalyst of formula M₂PdX₄, where M is Li, Na or K and X is Cl, Br or I. The method enables 1- and 2-indanones, which are useful for pharmaceutical products to be prepared with high selectivity.

Preparation of Noble Metal Combustion Catalysts

TANAKA KIKINZOKU KOGYO

Japanese Appls. 2/169,029-30

Combustion catalysts are prepared by dipping carriers in aqueous nitric acid solutions of (a) dinitrodiamine complexes of at least one of Pt, Pd and Ru, or (b) Rh nitrate; mixed with aldehydes and surfactants, so that the noble metal is reduced and deposited on the carrier. High catalytic activity is obtained because noble metal particulates are uniformly dispersed on the carrier, and because a large surface area of the carrier is retained by using the cationic surfactant.

New Waste Gas Purification Catalyst

TOYOTA JIDOSHA K.K.

Japanese Appl. 2/191,548

A new catalyst to purify car exhaust has a support, a layer such as Al₂O₃ with Ce oxide and Pd oxide particles, and catalyst metals loaded on the layer. An example catalyst has a monolithic support, 0.05 mol/l Pd, 0.3 mol/l Ce, 120 g/l Al₂O₃, 1.5 g/l Pt and 0.3 g/l Rh. Sulphate anions formed from Al₂O₃, CeO₂, SO₂ and O₂ during lean combustion can be decomposed to SO₃, SO₂ and PdS by the Pd oxide, and the catalyst suppresses H₂S generation.

Dehydrogenation Catalyst for Preparation of Alkylbenzenes

IDEMITSU KOSAN K.K. *Japanese Appl.* 2/196,731

Alkylbenzenes are prepared by dehydrogenation of alkenylcyclohexenes at 300–500°C in liquid or gaseous phase in the presence of a catalyst consisting of 0.05–20 wt.% of Pt group metal complex anions supported on fibrous clay minerals. The catalyst is especially Pt complex anions on sepiolite. The catalyst shows high activity, and gives alkylbenzenes in high yield and selectivity.

Curved Plate Shaped Exhaust Purification Catalyst

MATSUSHITA ELEC. IND. K.K.

Japanese Appl. 2/198,641

A catalyst used for purification of combustion engine exhaust consists of a honeycomb ceramic support with an activated Al_2O_3 layer containing Pt group metals, and optionally Ba oxide and Ce oxide, coated on the curved surface of the support. A catalyst is produced which is shaped like a curved honeycomb structure plate.

Three-Way Catalysts with Two Different Layers on a Honeycomb Support

MATSUSHITA ELEC. IND. K.K.

Japanese Appl. 2/203,938 and 2/218,438

Catalysts for purification of exhaust gas consist of a honeycomb structure coated with (a) activated Al_2O_3 containing Pd, and then activated Al_2O_3 containing Rh; or (b) an activated Al_2O_3 layer containing Ce oxide and BaO or $BaCO_3$, then with Pd supported on Al_2O_3 containing Pt, mixed with Rh supported on Al_2O_3 containing Ce. The catalysts are useful for treating hydrocarbons, CO and NO_x exhausted from household appliances and automobiles.

Exhaust Purification Catalyst Containing Platinum and Rhodium

TOYOTA JIDOSHA K.K. *Japanese Appl.* 2/207,842

A waste gas purification catalyst is produced by loading an activated Al_2O_3 coated support with Pt and Rh using a mixed gas of Pt and Rh compounds, for example a mixed gas of Pt fluoride and Rh fluoride. An example catalyst contained 1.5 g/l Pt and 0.3 g/l Rh. Crystal growth of the Pt and Rh can be minimised, so that the catalyst has improved durability. The catalyst is used for removing hydrocarbons, CO and NO_x from car exhaust.

Exhaust Purification Catalyst with Segregated Precious Metals

TOYOTA JIDOSHA K.K. *Japanese Appl.* 2/218,439

An exhaust gas purification catalyst is manufactured by adding zeolite – which has been ion exchanged with Pd – to an Al_2O_3 slurry to form an activated Al_2O_3 layer on the zeolite by a wash coat method, and then supporting Pt and Rh on the activated Al_2O_3 layer. In an example the activated Al_2O_3 was also impregnated with Ce and La.

Catalytic Rebalance Cell for Chromium-Iron Redox Accumulator

SIEMENS A.G.

German Appl. 3,843,312

An Fe^{3+} ion reduction catalyst consists of hydrophobised active C loaded with a Pt group metal, Au or Ag, or hydrophobised WC, and is used for reduction of Fe^{3+} ions with H_2 in a rebalance cell for a Cr/Fe redox ion accumulator. The catalyst separates the H_2 gas space from the Fe^{3+} electrolyte liquid space. The reduction process is accelerated, making the rebalance cell practical.

Exhaust Purification Catalyst with Separated Catalytic Metals

MAZDA MOTOR CORP.

German Appl. 4,004,572

An engine exhaust gas purification catalyst consists of a catalyst support, a first coating of active Al_2O_3 containing 1.0 g/l Pt and Rh, and a second coating of 0.5 g/l Pd (minimum) and a composite powder having Zr and La (1–10%) on the surface of Ce (5–30%). The catalyst has excellent temperature resistance, and Pt and Rh in one layer prevents the Pt sintering, while Zr and La prevent thermal deterioration of Ce.

Methanol Synthesis Catalyst Production

AKAD. WISSENSCHAFT DDR

East German Patent 276,429

A catalyst for CH_3OH production is prepared by impregnating a highly porous mineral support with an aqueous solution containing 2–5 wt.% Pd as a Pd salt, 0.2–1 wt.% Co, Ni or preferably Fe as an activator, and 0.5–5 wt.% Na and/or 0.5–10 wt.% Mg as promoter, followed by drying, calcining, and reducing. The catalyst has high quality properties and is used for CH_3OH production.

Palladium Catalyst for Hydrogen Purification

AZERB. AZIZBEKOV. PETROCHE.

Russian Patent 1,528,542

Spent catalyst from hydrogenation of acetylenic hydrocarbons, which contains 1.2–1.4 wt.% Pd is used in the purification of H_2 . The purification is in two stages: the first removes Hg by adsorption purification, reducing the Hg content to 0%, and the second reduces O_2 in the presence of the Pd catalyst at 25–100°C, to give 0.035% O_2 in the purified H_2 product. The method gives increased purification and simultaneous removal of Hg.

Palladium Catalyst for Production of Succinic Anhydride

AS. USSR BASHKIRSK

Russian Patent 1,541,210

Succinic anhydride is prepared by hydrogenation of maleic anhydride at 15–50°C, at a H_2 pressure of 1–30 atm, in an acetone medium, and in the presence of a Pd/C catalyst modified with triethylamine at a Pd:(C_2H_5)₃N molar ratio of 1:(0.5–2). The method offers increased productivity; giving 100% yields of succinic anhydride, which is an intermediate for products used in the agriculture and printing industries.

HOMOGENEOUS CATALYSIS

Isomerisation of Saturated Alkyl Carboxylic Acids

DU PONT DE NEMOURS CO. *European Appl.* 374,687A

A process for isomerisation of 4–20C saturated alkyl carboxylic acids involves heating at 170–250°C and a CO pressure of 200–10,000 psi, in the presence of an iodide or bromide promoted Rh catalyst present at 1 part wt. Rh to 50–200 parts wt. saturated acid. This gives an improved process for isomerisation of linear branched carboxylic acids, for example isomerisation of 2-methylglutaric acid to adipic acid.

Palladium Catalyst for Preparation of Nabumetone

HOECHST CELANESE CO. *European Appl.* 376,516A

Nabumetone is prepared by reacting 2-bromo-6-methoxynaphthalene with 3-buten-2-ol at 50–200°C, for 0.25–10 hours, in an inert atmosphere, and in the presence of a Pd catalyst. The catalyst consists of a Pd compound combined with a trivalent P ligand, for example Pd(II) acetate with triphenyl phosphine, and is regenerated by using with a base. The product is a non-steroidal anti-inflammatory drug, and is produced in high yields.

Recovery of Homogeneous Rhodium Catalysts

ELI LILLY & CO. *European Appl.* 376,610A

A homogeneous catalyst containing a Pt group metal, especially Rh, can be recovered in high yield from a reaction mixture by (a) solvent removal, (b) addition of a lower alkanolic acid, and (c) recovering the precipitated catalyst. The process can be used for recovery of Rh(II) octanoate catalysts used in 1-carbacephem carboxylate production, giving the catalyst in active form and ready for re-use.

Stereo Selective Ruthenium Catalysts for Asymmetric Hydrogenation

TAKASAGO INT. CORP. *European Appl.* 385,733A

Preparation of an optically active 6-t-butoxy-3,5-dihydroxyhexanoic ester from a 4-t-butoxyacetoacetic ester includes two asymmetric hydrogenation steps in the presence of different Ru-optically active phosphine complex catalysts. The product can be obtained in good yield, at high stereo selectivity.

Palladium Catalyst System for Carbonylation

SHELL INT. RES. Mij. B.V. *European Appl.* 386,833A

A catalyst system for carbonylation consists of a Group VIII metal compound, specifically a Pd(II) compound, a phosphine compound, and optionally a protonic acid. The catalyst is used for carbonylation of an acetylene or olefin compound using CO, and may be used to prepare α , β -olefinically unsaturated compounds or methyl methacrylate.

Rhodium Carbonylation Catalyst for Preparation of Carboxylic Acids

B.P. CHEMICALS LTD. *European Appl.* 391,680A

Preparation of (n + 1)C carboxylic acids is effected by reaction of CO with an nC alcohol in the presence of a Rh catalyst, in a liquid reaction medium containing water and a catalyst stabiliser from quaternary ammonium iodides. Using this process, precipitation of Rh containing complexes from the reaction medium is reduced.

Manufacture of Glycols by Epoxide Hydrocarbonylation

HOECHST CELANESE *U.S. Patent* 4,935,554

A single-step process for manufacture of 1,3-propanediol is by hydrocarbonylation of an epoxide at 50–200°C and 200–10,000 psig pressure, using a reaction mixture containing: 0.01–30 wt.% ethylene oxide, 0.00001–0.2 M Rh as catalyst, tricyclohexylphosphine, H₂O, CO, H₂, and an acid, in ether. The process gives increased yields of 1,3-glycols which are used as intermediates in the manufacture of esters and polyesters.

Novel Preparation of Arylalkenes

EASTMAN KODAK CO. *U.S. Patent* 4,935,559

A novel preparation of an arylalkene compound and an alkyl iodide is by reaction of an iodoaromatic compound, an alkene and an alkanol at 15–200°C, in the presence of 0.05–5.0 wt.% of a Pd catalyst, preferably Pd acetate, and the absence of Bronsted bases. The method is used for preparation of styrene, 1,4-divinylbenzene, and 1,3-divinylbenzene, and enables easier separation of the iodoalkane species from the reaction products, and easy recovery of I.

Palladium Catalyst System for Preparation of Conjugated Dienes

SHELL OIL CO. *U.S. Patent* 4,943,670

Butadiene derivatives are prepared by reacting propadiene or 1,2-butadiene with a formic acid salt in the presence of a catalyst system having a Pd salt and a P compound. The products are conjugated dienes which are used as monomers for elastomers and rubbers, and as intermediates for catalysts, pharmaceuticals and agrochemicals. The products are obtained in high yields with good conversion, from readily available starting materials.

Pyrochlore Catalysts for Oxidation of Organic Compounds

MONSANTO CO. *U.S. Patent* 4,959,494

Organic compounds are produced by oxidation of alcohols, olefins, alkynes, carbohydrates, aldehydes, ketones and vicinal diols with O₂, in the liquid phase at 20–100°C and 25–100 psi, using pyrochlore catalysts containing Pt, Rh, Ir, Os or especially Ru. The method is useful for production of polycarboxylates and carboxylic acids, and high conversion and selectivity are obtained for conversion of cyclohexanediol to adipic acid.

One-Step Preparation of Schiff's Bases from Olefins

AGENCY OF IND. SCI. TECH. *Japanese Appl.* 2/157,253
Schiff's bases are produced efficiently in one step by reacting olefins and isonitriles at 50–200°C in the presence of a Ru complex and H₂. Preferred Ru complexes are those of lower valent Ru, having CO, organic phosphines or unsaturated hydrocarbons as ligands, for example Ru(CO)₅. The Schiff's bases are used as intermediates for N compounds, additives for polymers, and as functional materials for liquid crystals.

Preparation of Epoxy Compounds from Olefins

SUMITOMO CHEM. IND. K.K. *Japanese Appl.* 2/157,270
Epoxy compounds are prepared by reaction of lower olefins with organic hydroperoxides using a catalyst consisting of one or more compounds containing Ru and/or Os, and Mo compounds. The mol ratio of Ru and/or Os:Mo is below 1. The products are useful materials for antifreeze, surfactants, polyesters, polyurethanes, perfumes or cosmetics.

Rhodium Hydroformylation Catalyst

SAGAMI CHEM. RES. CENTRE *Japanese Appl.* 2/174,740
Aldehydes are prepared by reacting CO and H₂ with a terminal olefin, at 50–250°C and 8–300 kg/cm² pressure, in the presence of a catalyst consisting of Rh and Re compounds. The catalyst is highly active, stable, and has high selectivity. This gives a high yield industrial method for manufacturing aldehydes by hydroformylation in the liquid or air phase; the products are useful as materials and intermediates in organic syntheses.

Ruthenium Hydrogenation Catalyst for Preparation of 1,4-Butanediol

MITSUBISHI KASEI CORP. *Japanese Appl.* 2/200,648
1,4-Butanediol and/or tetrahydrofuran are prepared by catalytic hydrogenation of succinic acid and/or succinic anhydride at 50–250°C and 0.1–200 kg/cm² H₂, using a catalyst consisting of a Ru compound, an organophosphine, and a hexafluorophosphate anion. The Ru can be present as metallic Ru, a Ru salt, Ru oxide, or a Ru complex. By using the catalyst, the products are prepared in higher yield and selectivity under mild conditions.

Ruthenium Catalyst System for γ -Butyrolactone Preparation

MITSUBISHI KASEI CORP. *Japanese Appl.* 2/200,680
 γ -Butyrolactone is prepared by catalytic hydrogenation of maleic acid and/or maleic anhydride in the liquid phase in the presence of a catalyst consisting of Ru compound(s), organophosphine(s), conjugated base(s), and one or more chlorine-containing compounds. Using the catalyst, γ -butyrolactone is prepared with higher yield and selectivity.

Oxidation of Monoolefins to Ketones

ATOCHEM. *French Appl.* 2,638,739
A process for the oxidation of terminally unsaturated monoolefins is effected in a liquid medium containing a tertiary alcohol and >5 wt.% water, and a catalyst consisting of AgNO₃, and Pd in the form of a salt, a complex and optionally an organophosphorus compound. The method is particularly useful for the preparation of ketones, especially methyl ketones, and results in higher selectivity and productivity.

Palladium Carbonylation Catalyst for Production of Ketenes

RHÔNE-POULENC CHIMI. *French Appl.* 2,639,940
Ketenes are prepared by reaction of a gem-dichloroalkane with CO in the presence of Pd and a phosphine, where the Pd is in the form of finely divided metallic Pd or complexes. The method is specially suited to the production of ketene from methylene chloride. This method does not need pyrolysis techniques, using acids or acid anhydrides, which call for extreme reaction conditions.

Synthesis of Symmetrically Substituted Ureas

POUDRES & EXPLOSIFS *French Appl.* 2,643,078
A new synthesis of symmetrically substituted ureas is by reaction of a primary amine and CO₂ in the presence of an ethynyl derivative and a Ru, Os and/or Fe complex. The synthesis has a shorter reaction time, and high purity of the crude product avoids an extra purification stage and the difficult removal of contaminants. The products are intermediates in the synthesis of pharmaceuticals.

Enantio-Selective N-Acyl (S)-Amino Acid Production

AKAD. WISSENSCHAFT D.D.R. *East German Patent* 275,671
Production of N-acyl (S)-amino acid derivatives is achieved by catalytic asymmetric hydrogenation of a solution or suspension of the corresponding acrylate, in the presence of a chiral Rh chelate catalyst of the carbohydrate-bis (phosphinous ester) type, having free OH groups in the sugar. The catalyst provides a more rapid reaction and a better optical field than known catalysts. The products are useful as pharmaceuticals or intermediates.

Rhodium Hydrogenation Catalyst for Preparation of Piperidine

MOSCOW LOMONOSOV. UNIV. *Russian Patent* 1,327,493
Simplified production of piperidine or its derivatives is by hydrogenation of pyridine at pH 1–2.5, in isopropanol, in the presence of a mineral acid and a Rh catalyst of formula RhCl(CH₃-CH(COOH))_n; where n is 6 or 4. The catalyst is moisture-resistant and easily separable, and results in 100% yields of piperidine and its derivatives, which are used in the synthesis of biologically active substances.

FUEL CELLS

Platinum Alloy Electrocatalyst for Fuel Cell

N.E. CHEMCAT. CORP. *European Appl.* 386,764A

An electrocatalyst consists of a Pt-Fe-Co-Cu quaternary ordered alloy containing 40–70 at.% Pt, 9–27 at.% Fe, 9–27 at.% Co, and 9–27 at.% Cu dispersed in and on a conductive carrier, such as a C powder. The alloy preferably has an average crystallite size not above 100 Å. The catalyst has high activity, a long life, and is used in an acid electrolyte fuel cell.

Fuel Cell Catalyst with Platinum and Platinum Alloy Crystallites

INT. FUEL CELLS CORP. *U.S. Patent* 4,937,220

A high surface area Pt catalyst consists of approximately equal amounts of Pt and Pt alloy crystallites dispersed on a C support. The Pt alloy crystallites are Pt₃Cr, PtV, PtMn, PtMo or PtW, and are used with Pt to retard recrystallisation. The catalyst is used in the cathode and anode of fuel cells.

CHEMICAL TECHNOLOGY

Regeneration of Metal Oxides after Oxidation of Waste

U.K. ATOMIC ENERGY AUTH.

British Appl. 2,226,331A

Oxides of Rh, Ir, Os or Ru are used in the oxidation of waste material, particularly waste containing polychlorinated biphenyls. After treatment of the waste substance the metal oxide is regenerated to the higher valency state by an electrochemical process.

GLASS TECHNOLOGY

Platinum Bushings for Spinning Glass Fibre

TANAKA KIKINZOKU KOGYO *Japanese Appl.* 2/97,433

Bushings for spinning glass fibre or continuous glass filament are made of Pt or Pt alloy, with a bushing plate reinforcedly supported from the underside with a Si₃N₄ support with a coating of Al₂O₃ or ZrO₂.

ELECTRICAL AND ELECTRONIC ENGINEERING

Thin Film Amorphous Alloy with Good Magneto-Optical Properties

MITSUI PETROCHEM. IND. K.K.

European Appl. 364,631A

A thin amorphous alloy film contains Fe and/or Co, Pt and/or Pd, and at least one other element from specified groups, and has an easy axis of magnetisation perpendicular to the film face. The film has excellent magneto-optic properties, including high coercive force and large Kerr and Faraday angles, and has high oxidation resistance and reflectance.

Magneto-Optical Recording Element

EASTMAN KODAK CO. *European Appl.* 367,685A

A magneto-optical recording element includes a layer of magneto-optical medium on a substrate. This layer consists of alternating Co layers about one atom thick and Pd layers at least 6 Å thick. An increased carrier to noise ratio is obtained, and less materials and manufacturing time are required than for conventional magneto-optical recording elements.

Palladium Plated Connection Leads for Plastic Packaged IC

TEXAS INSTRUMENTS INC. *European Appl.* 384,586A

A high reliability plastic package for a semiconductor IC includes leads for external connection which are Pd plated and solder dipped, where the Pd plating consists of 80% Pd-20% Ni. The device also includes a semiconductor support which is Pd plated, and Au wires for connecting the plated leads to the IC. The Pd plated leads provide high reliability wire and frame bonding, with high crack and corrosion resistance, and good economy.

High Current Density Cathode Containing Iridium

U.S. SEC. OF THE ARMY *U.S. Patent* 4,911,626

A long-life, high current density cathode consists of a sintered billet of W and Ir powders which is impregnated with a mixture of powdered emitter coated with Rh, Ir, Os or W, followed by Ir and Ba peroxide. This is achieved by firing in dry H₂ for about 2 min above the melting point of the impregnent; and cooling the billet and removing any pieces of loose impregnent. The cathode is used in microwave devices, and provides a higher energy density than currently available.

Manufacture of Electrochromic Planar Dimmer

TOYODA GOSEI K.K.

U.S. Patent 4,933,050

A planar dimmer is made by applying long stripes of a thermosetting resin paint mixed with Pd and Cu on a glass or resin base, heating to harden the paint, immersing in acid, and forming metal films on the stripes by electroless plating. An electrode layer is then formed on the base, and a colour forming layer formed on the electrode layer. The dimmer colours and discolours throughout, quickly and evenly.

Silver-Palladium Thick Film Conductor Compositions

DELCO ELTRN. CORP.

U.S. Patent 4,939,022

A first thick film conductor composition consists of 60–90 wt.% Ag, 0.5–5 wt.% Pd, and 0–25 wt.% Al₂O₃ and/or 0–15 wt.% SiO₂. A second thick film conductor including Ag and Pd in wt. ratio of at least 0.25 makes a low electrical resistance contact with the first. Thick film conductive films primarily of Ag compatible for use with those of Ag and Pd are used in "hybrid devices"; useful in situations where film discontinuities are a problem.

Electronic Coating Composition Containing a Platinum Catalyst

GENERAL ELECTRIC CO. U.S. Patent 4,943,601

A latent curable electronic coating composition which is stabilised against premature gelation consists of an olefin organopolysiloxane, an organohydrogen polysiloxane, a Pt catalyst to cause co-reaction of these siloxanes, a combination of inhibiting agents, and a silanol-containing dimethylsiloxane hydrolysate. The composition can be cured on a substrate at elevated temperature, and has improved adhesion to substrates.

Ground Coating Conductive Paint Composition

SUMITOMO METAL MINI K.K.

Japanese Appl. 2/86,665

A paint composition consists of 50–80 wt.% metallic powder comprising Ag powder or 90–99 wt.% Ag powder (average particle size 0.5–3.0 μ m) and 10–1 wt.% Pd powder (average particle size up to 0.3 μ m); acid-proof glass powder, glass powder containing PbO, and an organic vehicle. The composition is used prior to metal plating on the terminal electrodes of laminated Pb perovskite capacitors of the sintered type, to give high corrosion resistance.

Oxidation Resistant Rare Earth Permanent Magnet

TOHOKU METAL IND. LTD. *Japanese Appl. 2/87,502*

A rare earth permanent magnet consists of a matrix mainly consisting of a Ru-rare earth element-transition metal phase, dispersed in which is a tetragonal magnetic compound containing rare earth elements, transition metals and B. The magnet is made by magnetic moulding a starting powder which is a mixture of the Ru and magnetic phase. The rare earth magnet has good oxidation resistance.

Platinum-Manganese-Antimony Compound for Magneto-Optical Use

KUREHA CHEM. IND. K.K. *Japanese Appl. 2/92,900*

A PtMnSb compound for magneto-optical applications is prepared by polishing the surface of a PtMnSb compound raw material having a C_{4v} -type crystalline structure, and then heat treating at 100–700°C. A material with a large magnetic (phonetic) rotation angle is obtained.

Rare Earth Permanent Magnet with Matrix Containing Palladium

TOHOKU METAL IND. LTD. *Japanese Appl. 2/117,103*

A rare earth permanent magnet has a matrix containing Pd, a rare earth element, and a transition metal, with a dispersed phase of an R₂Tl₂ intermetallic compound (where R is a rare earth element and T is a transition metal). The permanent magnet is prepared by field pressing rare earth magnet alloy powder, and has good oxidation resistance.

Screen Ink Compositions for Preparation of Thin Film Resistors

MATSUSHITA ELEC. IND. K.K.

Japanese Appl. 2/155,964

Screen ink compositions are formed by kneading mixtures containing a Ru compound, optionally a metal compound (not Ru), a carboxylic acid of a terpenoid, amine salts of abietic acid and of rosin, and a solvent. The screen inks are screen printed and baked to form thin film resistors, which are used as heads of heat sensitive printers and electrodes.

Superconducting Oxide Film with Platinum Base Material

MITSUI MINING & SMELTING

Japanese Appl. 2/162,616

A complex oxide film of Bi, Sr, Ca and Cu is formed on a base material which may consist of Pt, Au, Ag or Cu, or an alloy having one of these as the major component. The film is doped with Pb from a vapour atmosphere to produce a superconductive film. A c-axis oriented film is easily produced which has a critical temperature of 100K, and is useful as a low resistance substrate circuit or magnetic shield plate.

Ruthenium Oxide System Thin Film

MATSUSHITA ELEC. IND. K.K.

Japanese Appl. 2/177,502

A Ru oxide system thin film consists of Ru, one or more of Pt, Ti, Si, Mo and W, and oxygen. The thick film is etched by plasma etching, preferably by reactive ion etching using CF₄. The method is used to obtain fine patterns of Ru oxide system thin film with good precision.

Electroconductive Paste for Aluminium Nitride Substrate Circuit Board

DAIKEN KAGAKU KOGYO *Japanese Appl. 2/208,275*

An electroconductive paste containing Cu, Pd, glass frit, resin, and solvent is used for IC boards which are capable of being electroplated without activation of the AlN substrate. The circuit board is made by forming the electroconductive circuitry on an AlN substrate by coating the paste thickly, firing the substrate, and plating without substrate activation. Using this method the plating processes are simplified.

Glaze for Platinum-Based Resistance Layers

VEB. THERMO GERBERG

East German Patent 275,311

A low cost glaze is used to passivate Pt-based resistance layers on ceramic substrates. The glaze is crystallising, hermetic, has a high melting point (950–980°C), and contains SiO₂, Al₂O₃, ZnO, B₂O₃, BaO, Na₂O, and small amounts of other oxides. The glaze has a high insulation resistance, a resistance to voltages up to 500 V, and a lower thermal coefficient of expansion. The Pt resistor degrades less due to reduced material transfer.

MEDICAL USES

Stable Aqueous Solution of Cisplatin for Parenteral Administration

BRISTOL-MYERS SQUIB. *European Appl.* 369,714A
A stable aqueous solution of cisplatin in a sealed container has a pH of 5–7.5 and contains up to 1 mg/ml cisplatin and a pharmaceutically acceptable source of chloride ion equivalent to 20–100 mg/ml of NaCl. The solution contains less aquated Pt species, is closer to physiological pH, and is used for parenteral administration of cisplatin.

New Platinum Complexes for Treating Malignant Tumours

LAB. BELLON R. *European Appl.* 389,338A
New Pt complexes such as cis (2-amino, 2-aminomethyl bicyclo-(3,2,1)-octane) dichloro Pt are prepared by reacting K tetrachloroplatinate with a diamine at 0–80°C, in a N₂ atmosphere. The complexes are used for treating malignant tumours, particularly cancers of the digestive system, pulmonary systems, testicles, ovaries, as well as cancers of the head and neck. The dose is 250–1000 mg/m² for humans, either orally or intravenously.

New Diaminocyclohexane Platinum Complexes with Anti-Tumour Activity

SHIONOGI SEIYAKU K.K. *European Appl.* 390,138A
New anti-tumour diaminocyclohexane Pt(II) complexes are effective against cisplatin-resistant ascitic murine leukaemia, murine leukaemia, and solid tumours with only slight haemotoxicity and nephrotoxicity. The Pt complexes can be administered parenterally to humans and animals, for example intravenously or by an intravenous drip.

Platinum Xerogels with Anti-Tumour Activity

AS. UKR. PHYS. CHEM. *World Appl.* 90/8,768A
New Pt-containing xerogels are prepared by reacting a Pt complex such as cisplatin with a polymethylsiloxane hydrogel in aqueous NaCl solution. The products are 3-dimensionally crosslinked polymers with a globular structure, having globule diameter 4–7 nm and surface area 80–200 m²/g. The xerogels are used as anti-tumour agents.

Novel Boron-Free Palladium Dental Alloy

PIERCE & STEVENS CO. *U.S. Patent* 4,917,861
A dental alloy of exceptional high temperature strength consists of 50–85 wt.% Pd, 5–40 wt.% Co and/or Cu, 1–15 wt.% Ga, up to 5 wt.% Ru, Au, Ni, In, Sn and mixtures as modifier, 0.01–0.05 wt.% Ge, Li and mixtures as an O₂ scavenger, and up to 0.5 wt.% Ir, Re and mixtures as a grain refiner. The alloy is used for dental restorations, and has high tarnish resistance, good bonding, and good casting characteristics and solderability.

Conjugate Platinum Coordination Compound Monoclonal Antibody Complexes

JOHNSON MATTHEY P.L.C.

U.S. Patents 4,952,676 and 4,956,454

New conjugate Pt co-ordination compound/monoclonal antibody complexes contain amine groups, and have a functional polymethylene moiety of ether, ester and/or peptide groups. The complexes can be prepared by linking the monoclonal antibody to the Pt co-ordination compound via a peptide linkage. The complexes are useful as site-specific or disease-specific chemotherapeutic agents for treatment of tumours.

Electrode for Use in a Living Body

INA SEITO K.K.

Japanese Appl. 2/107,229

An electrode used for measurement of electric phenomena in a living body has a non-degradable electrically conductive material including Pt, Ti or C, homogeneously dispersed in a substrate material such as hydroxy apatite, or formed as a separate layer. The electrode can be strongly adhered to a living body because of its high affinity for the living body and surface activity, and electrode activity can be maintained for a long time.

Metal Composite Material for Dental Use

TOKURIKI HONTEN K.K.

Japanese Appls. 2/147,175–78

A metal composite consists of a 0.05–0.5 mm thick alloy plate containing 10–25 wt.% Au, 15–35 wt.% Pd, 45–70 wt.% Ag, and optionally (a) 5–15 wt.% Cu, or (b) 0.1–5 wt.% Sn and/or In. The plate is superposed on one side of an expanded net or coated with alloy powder or granules, followed by hot bonding at 600°C or above.

α -Aryl Propionic Acid Preparation for Anti-Inflammatory

DAICEL CHEM. IND. K.K. *Japanese Appl.* 2/164,841

α -Aryl propionic acid is prepared by reaction of α -aryl ethyl alcohol with CO at 80–180°C, in the presence of a Rh catalyst and an I-containing compound in atomic ratio Rh:I 1:0.5–6; and additionally a compound to form a complex with Rh, and an acid compound. The product is useful for analgesic anti-inflammatories.

Platinum Complexes as Low Toxicity Anti-Tumour Agents

TANABE SEIYAKU K.K.

Japanese Appl. 2/212,497

New Pt complexes are useful as anti-tumour agents with low toxicity and high water-solubility. The Pt complexes can be administered orally or parenterally in the form of tablets, capsules, powders, injections or suppositories at a daily dose of 10–500 mg/m². The Pt complexes can be used for treatment of malignant lymphoma, leukaemia and tumours.

The New Patents abstracts have been prepared from material published by Derwent Publications Limited.