

# NEW PATENTS

## METALS AND ALLOYS

### Gold Based Alloy for Jewellery

LENGD. RUSSKIE SAMOT. *Russian Patent 1,498,809*  
A Au based alloy contains 58.0–59.0 wt.% Au, 3.5–4.5 wt.% Pd, 7.5–8.5 wt.% Ag, 0.7–1.5 wt.% In, 0.5–1.2 wt.% Mn and balance Cu. The alloy has improved ductility and is used for jewellery.

## ELECTROCHEMISTRY

### Oxygen Generating Electrode for Electromagnetic Propulsion Vessel

M. MUROYA *Japanese Appl. 2/77,394*  
An O<sub>2</sub> generating electrode consists of a Ti base material coated with at least one oxide of RuO<sub>2</sub> or IrO<sub>2</sub>, on which is a Mn oxide layer. The RuO<sub>2</sub> and/or IrO<sub>2</sub> layer promotes the O<sub>2</sub> generating reaction, prevents dissolution of the Ti, and attaches the Mn oxide layer. The electrode has good O<sub>2</sub> generating efficiency, is used for electromagnetic propulsion vessels, and generates less chlorine, thus reducing environmental pollution.

### Electrochromic Material Containing Rhodium

OSAKA GAS K.K. *Japanese Appl. 2/86,683*  
An electrochromic material consists of a viologen Rh complex prepared by reaction of Rh chloride and 4,4'-dimethyl-2,2'-bipyridine by heating so that they dissolve in a solvent such as dimethyl formaldehyde. The complex shows an electrochromic phenomenon of red coloration to decoloration by electrochemical oxidation/reduction.

### Electrolysis Electrode Manufactured Using Ion-Beam Mixing

LIMES K.K. *Japanese Appl. 2/88,785*  
An electrode is manufactured by using an ion-beam mixing method to form an amorphous alloy layer consisting of at least one Fe group element, at least one platinum group element, and at least one of Ti, Zr, Nb and Ta, on the surface of a metal substrate, and treating the alloy film with acid. This provides an electrode material with an irregular surface suitable for electrolysis of brine water.

### Activating Titanium Anodes 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 Ru chloride. Oxidising is by spark discharge under a direct voltage of 10–200 V, followed by optional treatment with platinum group metal chlorides, and tempering.

## ELECTRODEPOSITION AND SURFACE COATINGS

### Non-Corrosive Palladium Electroplating Solution

AT. & T. BELL LAB. *U.S. Patent 4,911,798*  
Electroplating of Pd and Pd alloys uses a bath containing 0.0001M to 0.1–0.5M (saturated) Pd, an alloying metal from Pt, Rh, Ir, Ru, Au, Ag, Cu, Ni, Co, Cr, and Mn, an alkylhydroxyamine as complexing agent, and a buffer system. A corrosion resistant coating with high electrical conductivity is produced, for example, for connector pins.

### Palladium Electroplating Bath

AT. & T. BELL LAB. *U.S. Patent 4,911,799*  
A novel electroplating process uses a bath of pH 6.0–13.5, containing a Pd source, an alkyl ammonium chloride surfactant with 4–35C, and a specified brightener, for example o-benzaldehyde-sulphonic acid. The process is used for electrical contact surfaces in contact devices or electrical connectors. The plated films have excellent adhesion and ductility, are crack-free, have a bright finish, and show excellent electrical contact and wear properties.

### Electroplating Process for Through Hole Circuit Boards

SHIPLEY CO. *U.S. Patent 4,919,768*  
A non-conductive body is electroplated by treating the surface in sequence with a >0.01 M Sn<sup>2+</sup> salt solution, a 0.00001–1.0 M sulphide solution, a 0.001–0.01 M Pt or Pd salt solution, and electroplating the resulting surface with Cu or solder.

### Erosion Resistant Coating with Platinum Layer

AVCO CORP. *U.S. Patent 4,919,773*  
A coating used to impart erosion resistance to a stainless steel or Ti alloy substrate has 3 layers: a ductile barrier layer of e.g. Pt of 0.1–1.5 mils thickness, a layer of pure metal selected from Groups III–VI of thickness 0.2–1.5 mils, and a layer of a boride, carbide, oxide or nitride element from the above Groups of thickness 0.2–2.5 mils. The coating may be used for components of a gas turbine engine, and gives improved erosion resistance without degradation of the mechanical properties of the substrate.

### Addition of Palladium Solution to Copper Plating Liquid

TOYAMA NIPPON DENKI *Japanese Appl. 2/70,069*  
A Pd solution is added quantitatively to a Cu plating liquid extracted into a reaction cell, while the Cu ion concentration is measured continuously by colorimeter. This determines the time period until the concentration reaches a set value, and a deficient amount of stabiliser is added to the plating bath.

## Ground Coating Conductive Paint Composition

SUMITOMO METAL MINI K.K.

*Japanese Appl. 2/86,665*

A paint composition contains 50–80 wt.% metallic powder which is either Ag powder or a mixture of 90–99 wt.% Ag powder (0.5–3.0  $\mu\text{m}$ ) and 10–1 wt.% Pd powder (up to 0.3  $\mu\text{m}$ ), acid-proof glass powder,  $\text{PbO/ZnO/B}_2\text{O}_3/\text{SiO}_2$  glass powder, 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.

## Two-Tone Coloured Metal Plating for Watch Casings

CASIO COMPUTER CO. LTD. *Japanese Appl. 2/111,537*

A two-tone coloured metal plated synthetic resin product is prepared by coating the surface of a moulded synthetic resin product with an underplating metal, plating with Pd metal, plating with Au metal, partly masking the Au layer, releasing the unmasked Au layer to expose Pd, and releasing the mask to reveal the Au plated portions. This method has high plating workability, and is used for making aesthetic watch casings.

## Improved Rhodium Deposition on Discs

AUTOM. ELEMENT CONS. *Russian Patent 1,507,878*

Improved electroplating of discs with enhanced uniformity is achieved using a unit including a drive for lifting and lowering the disc, a shaker mechanism and a vibrator attached to rigidly tied screens. The unit gives improved Rh film deposition on working faces of discs, and eliminates coat porosity.

## APPARATUS AND TECHNIQUE

### Carbon Monoxide Gas Sensor with Platinum Coils

SEIKO CO. LTD.

*European Appl. 358,925A*

A catalytic combustion type CO gas sensor includes a gas sensitizer to determine the CO concentration, based on the difference in resistance of two Pt coils on the catalytic combustion of CO, one in the active section and the other in the compensating section. The device has low cost, high reliability and provides easy handling, and may be used to detect CO emitted from domestic gas appliances due to incomplete combustion.

### Rapid Oxygen Sensing Device

NAT. AERO & SPACE ADMIN. *U.S. Patent 4,911,890*

A device for sensing the amount of molecular  $\text{O}_2$  in a gas includes a heated ceramic electrolyte disc coated with Pt electrodes, which generates a voltage output proportional to the partial pressure difference of the  $\text{O}_2$  in the product gas and the reference air. The amount of  $\text{O}_2$  in a combustion product gas is quickly sensed, to control the amount of  $\text{O}_2$  in the gas, in order to maximise efficiency and minimise pollution.

### Gas Sensor with Stable Properties

FIGARO GIKEN K.K.

*Japanese Appl. 2/28,548*

A gas sensor has a heat resisting insulating substrate, a  $\text{RuO}_2$  heater and a metal oxide semiconductor membrane, with a region of potential graduation between the  $\text{RuO}_2$  heater (low potential) and the membrane (high potential). Contamination of the metal oxide semiconductor with alkali metal ions such as Na by migration from the  $\text{RuO}_2$  heater can be prevented, and stabilised characteristics are maintained for a long time.

### Responsive Oxygen Sensor with Thin-Film Platinum Electrode

TANAKA KIKINZOKU KOGYO *Japanese Appl. 2/38,964*

A solid electrolyte type thin-film  $\text{O}_2$  sensor has a porous thin-film Pt electrode formed from an organic Pt ink and a thin-film zirconia solid electrolyte formed from an organic Zr ink. The organic Pt ink consists of 20% Pt resinate, 3% Bi resinate, 1% Pb resinate, 2% Si resinate, 1% Sb resinate, 53% gum rosin, and 20% terpeneol. A small-sized inexpensive, and highly responsive  $\text{O}_2$  sensor is obtained.

### Adsorbing Plate for Collection of Evaporated Platinum Particles

TANAKA KIKINZOKU KOGYO *Japanese Appl. 2/83,291*

When melting ferrite blocks or rods in a Pt or Pt alloy crucible for growing a ferrite single crystal, a Pt or Pt alloy adsorbing plate is placed above the crucible at a lower temperature, and Pt evaporating from the crucible is collected. The amount of Pt particles floating in the growth furnace environment is reduced, giving rise to a very pure ferrite single crystal.

### Platinum Crucible for Preparation of Sample Glass Bead

NIPPON STEEL CORP.

*Japanese Appl. 2/83,431*

A sample for use in fluorescent radiation is prepared by fusing a powdery sample in a Pt crucible to form a glass bead. Oxidant, sample, flux, and separating agent are put in the Pt crucible, oxidised at 800–900°C for 5–15 minutes, and fused at 1050–1200°C for 3–10 minutes. The glass bead can be prepared automatically in a short time, and can be analysed with high accuracy without damaging the Pt crucible.

### Enzyme Sensor with Precious Metal Substrate

TERUMO CORP.

*Japanese Appl. 2/87,056*

An enzyme sensor has a conductive substrate of Ir, Ru or Pd-oxide, Pt or Au, preferably in thin membrane shape, and an enzyme fixed membrane. The enzymes, for example glucokinase, are obtained from a thermophilic organism and can be grown at, and do not lose activity at  $>40^\circ\text{C}$ , so heat and solvent resistance are improved, and life is extended. The sensor can be easily used in mass production processes, and storing is easy.

## Apparatus for Determination of Acid Concentration in Fluids

SUMITOMO ELEC. IND. K.K.

*Japanese Appl. 2/122,249*

Apparatus used for determination of acid concentration in fluids consists of a measuring vessel, a graphite anode, a Pt cathode, a DC current supply unit, and a conductivity measuring unit. The acid concentration can be found with high sensitivity. The apparatus is easy to handle, has good chemical resistance, and corrosion and breakdown of the electrodes do not occur.

## Long Life Gas Concentration Sensor

FUJIKURA CABLE WORKS K.K.

*Japanese Appl. 2/126,149*

A gas concentration sensor with long life consists of porous Pt electrodes on either side of a solid electrolyte plate, with a cap covering the electrode and forming an internal chamber between the electrode and partition. Each electrode has a porous protective layer which is a mixture of  $Al_2O_3$  and Au. The  $Al_2O_3$  has a good Au adsorption, hence there is no decrease in electrode efficiency, and the electrodes are protected from  $SO_2$ .

## Sensor for Controlling the Level of Liquid Coolant

VEB. HOCHVAK DRESDEN *East German Patent 274,757*

The level of low boiling point liquid is controlled by a Pt resistance wire resistor covered with a ceramic layer, which is sealed inside a poor heat conducting protection tube. A heating current of 50–90 mA is applied to the Pt resistor which is part of a Wheatstone bridge unit. The sensor can distinguish between liquid or gas which avoids false recordings, and is used to control the level of liquid coolant, especially liquid  $N_2$ .

## Higher Quality Selective Electrode for Lactose Determination

AS. LITH. BIOCHEM. INS. *Russian Patent 1,502,995*

An electrode with increased selectivity for determination of lactose consists of a Pt electrode coated with a  $5\mu m$  thick separating membrane, and then with a bi-enzyme membrane containing co-immobilised glucooxidase and  $\beta$ -galactooxidase, with a microporous film on top. The current is measured versus a reference electrode, giving a linear current versus lactose content relationship up to 3.0 mM of lactose.

## Carbon Monoxide Thick Film Sensor

D.-W. LEE

*South Korean Patent 89/2,572A*

A CO thick film sensor has a diffused resistor layer deposited between the Si base plate and  $SiO_2$  layer, with vacuum deposited electrodes on the layer, an auxiliary layer coated above the electrodes, followed by the CO sensing layers and electrodes formed in sequence. The CO sensing material consists of 0.3–0.7 wt.% of Pt and 99.3–99.7 wt.% of  $TiO_2$  or ZnO.

## JOINING

### Brazing Alloy for Joining Superalloy Metals

GTE PRODUCTS CORP.

*U.S. Patent 4,839,141*

A brazing alloy with good gap filling and high temperature properties consists of 15–35 wt.% Pd, 5–30 wt.% Au, 10–30 wt.% Ni, 20–48 wt.% Cu, and 5–25 wt.% Mn, and has a brazing temperature of 1025–1080°C, a solidus temperature above 1000°C and a liquidus temperature above 1018°C. The brazing alloy is used in joining superalloy metals.

## HETEROGENEOUS CATALYSIS

### Production of a Hydrocarbon White Oil

UOP

*European Appl. 360,010A*

A hydrogenation catalyst, consisting of 0.05–5 wt.% of a platinum group metal on a refractory oxide support, is used in the production of a hydrocarbon white oil by hydrogenating a feed stream of 15–30C hydrocarbons obtained from an aromatic alkylation process. A white oil product is obtained.

### Novel Catalyst for Allyl Acetate Preparation

SHOWA DENKO K.K.

*European Appl. 361,484A*

A novel catalyst for allyl acetate manufacture consists of a carrier impregnated with 0.3–1.0 wt.% Pd, 0.2–1.0 wt.% of Cu, Pd, Rh and/or Ru, and an alkali metal acetate. The catalyst is used for the gas phase reaction of propylene, acetic acid and  $O_2$  at 140–170°C and 2–10 atm, giving high relative activity and selectivity, long life, and enabling a lower reaction temperature to be used, which reduces the corrosive effects of the acetic acid.

### Hydrogen Production by Shift Reaction Process

IMPERIAL CHEM. INDS. P.L.C.

*European Appl. 361,648A*

Catalysts showing good activity for the shift reaction process contain a metal such as Pd and preferably an alkali metal oxide or an alkaline earth metal oxide. A  $H_2$  containing gas stream is produced from a carbonaceous feedstock by forming a gas stream containing  $H_2$ , CO and steam at  $>700^\circ C$ , cooling to 550–650°C, passing over the Fe-free catalyst (no methanation activity) to catalyse the shift reaction, and cooling to  $<500^\circ C$ .

### Platinum Hydrogenation Catalyst for Preparation of Photostabilisers

CIBA GEIGY A.G.

*European Appl. 363,318A*

The preparation of 2-(2-hydroxyphenyl)-2H-benzotriazoles is carried out by catalytic hydrogenation of a nitrobenzene (2-azo-2) phenol compound in the presence of a supported 0.1–3 wt.% Pt hydrogenation catalyst and an organic amine.

### Platinum Based Knitted Fabric Catalyst

JOHNSON MATTHEY P.L.C. *European Appl.* 364,153A

A knitted precious metal fabric for use as a catalyst consists of a metal from the platinum group, Au and Ag; particularly Pt or Pd. The fabric is made by knitting the metal fibre with a supplementary fibre which is later removed. The fabric is used as a catalyst for  $\text{NH}_3$  oxidation, and results in increased conversion efficiency—90 to 95% compared with 90% for a conventional material—when tested in an  $\text{NH}_3$  oxidation reactor at medium pressure.

### Catalytic Production of Hydrogen Peroxide in an Aqueous Medium

ATOCHEM. *European Appl.* 364,374A

A catalytic process for production of  $\text{H}_2\text{O}_2$  involves reacting  $\text{H}_2$  with  $\text{O}_2$  at above atmospheric pressure in an aqueous medium free from organic compounds and containing a platinum group metal catalyst, especially Pt or Pd. The aqueous medium is first contacted with  $\text{H}_2$ , and then with  $\text{O}_2$ . The process is safe to operate, allows any chosen proportions of  $\text{H}_2$  and  $\text{O}_2$  to be used, and allows unused  $\text{H}_2$  and  $\text{O}_2$  to be recycled.

### Laminated Combustion Catalyst Element

GENERAL ELECTRIC CO. *European Appl.* 370,244A

The element has a metal alloy substrate, an oxidation resistant layer of Pt, Pd or Ru <0.0001 inches thick, and an  $\text{Al}_2\text{O}_3$  washcoat layer containing Pt, Pd, Rh or metal oxide as combustion catalyst. The element can be used in an oxidising atmosphere at high temperatures for an extended time, for example at 1800–2500°F, with a service life up to 8000 h. It is used as a combustion catalyst to reduce exhaust emissions from gas turbines.

### Three-Way Catalyst with Suppressed Hydrogen Sulphide Emissions

NIPPON SHOKUBAI KAGAKU

*European Appl.* 372,156A

An exhaust gas purification catalyst consists of activated  $\text{Al}_2\text{O}_3$  supporting 5–30 wt.% Pt and/or Pd, 1–20 wt.% Rh, Ce oxide, activated  $\text{Al}_2\text{O}_3$ , and optionally an alkali metal and/or Ni oxide; all coated on a honeycomb monolith carrier. The catalyst removes  $\text{CO}$ , hydrocarbons and  $\text{NO}_x$  from the exhaust gases of vehicle engines, while suppressing  $\text{H}_2\text{S}$  emissions.

### Palladium Catalyst for Hexamethylene Imine Preparation

DU PONT DE NEMOURS CO. *European Appl.* 372,492A

A gaseous mixture containing hexamethylene diamine vapour, water vapour and  $\text{H}_2$  is contacted with a solid catalyst of 0.1–10 wt.% Pd on  $\text{Al}_2\text{O}_3$  spheres, at 160–260°C and 0–100 psig, to prepare hexamethylene imine. The mixture may also contain at least one of  $\text{NH}_3$ ,  $\text{CH}_4$  or  $\text{N}_2$  which are believed to increase catalytic activity. High conversion of the diamine and high yields of the hexamethylene imine are obtained in the process.

### Catalytic Removal of Carbon Monoxide and Hydrocarbons from Waste Gases

JOHNSON MATTHEY INC. *World Appl.* 90/5,579A

A catalyst having good activity, durability, long life and resistance to S oxides consists of 0.005–2 wt.% Pt, Pd, Rh, Ir, Os and/or Ru on a  $\text{SiO}_2$ ,  $\text{ZrO}_2$ ,  $\text{TiO}_2$ , zeolite and/or  $\alpha\text{-Al}_2\text{O}_3$  support material, which may be applied to a ceramic or metallic monolith. The catalyst is used below 500°C in an oxidising atmosphere to treat waste gas from engines burning fossil fuels, and gives above 90% conversion for  $\text{CO}$  and above 50% for  $\text{C}_2\text{H}_6$ ,  $\text{C}_2\text{H}_4$  and so on.

### Preparation of Mixture of Paraphenylenediamines

MONSANTO CO. *U.S. Patent* 4,900,868

Preparation of a mixture of 2 or more different  $\text{N,N}'$ -disubstituted paraphenylenediamines is by reductive alkylation of a N-containing compound such as 4-nitrodiphenylamine, with 2 or more ketones in sequence, in the presence of  $\text{H}_2$  and a Pt/C catalyst. The cost effective, mixed ketone process is problem-free; a single ketone is recovered, a desired ratio of paraphenylenediamines is achieved, and less ketone is hydrogenated to alcohols.

### Preparation of Polymethylene in High Yield

U.S. DEPT. OF ENERGY *U.S. Patent* 4,904,700

Polymethylene is prepared by contacting a  $\text{H}_2/\text{CO}$  or water/ $\text{CO}$  mixture in a solvent with catalyst slurry of at least 1 wt.% Pt and/or Pd on a support having a deposit of Fe. The catalyst can operate under mild pressure and temperature conditions (100–300°C), and can be used in slurry form with dilute reactant concentrations to obtain high yields of the product. The polymer materials produced are useful as diesel or jet fuels.

### One Step Preparation of 2-Pyrrolidone

PHILLIPS PETROLEUM CO. *U.S. Patent* 4,904,804

Preparation of 2-pyrrolidone is effected by contacting a 1–10 molar excess of  $\text{NH}_3$  with succinic acid or anhydride and  $\text{H}_2$ , in the presence of at least one diluent and a Pd/ $\text{Al}_2\text{O}_3$  catalyst, with a molar ratio of succinic acid or anhydride: Pd of 1–1000. Reaction is at 200–300°C and at least 1000 psig for 0.5–18 h. The process enables a one step preparation of 2-pyrrolidone in higher yields than prior art processes.

### Catalyst Panels for Stationary Power Plant Exhaust Purification

W. R. GRACE CO. *U.S. Patent* 4,916,001

Removal of pollutants from the exhaust of hydrocarbon-fuelled power plants is achieved using rectangular unitised monolithic honeycomb catalyst panels, with a catalyst of Pd- $\text{V}_2\text{O}_5$  on  $\text{Al}_2\text{O}_3$ - $\text{ZrO}_2$ . Less structural material is required in the panels, which allows more catalyst to be exposed to exhaust gas, and reduces the pressure drop through the unit.

### Three-Way Automotive Exhaust Catalyst

W. R. GRACE CO.

*U.S. Patent 4,916,105*

The catalyst has a substrate, to which is applied a washcoat slurry consisting of water; 0.2–7 wt.% of a metal ferrite of formula  $MFe_2O_4$ , where M is Co, Ni, Cu, Zn, Mn or Fe; and 20–50 wt.% of catalysed  $Al_2O_3$  having 0.1–7.5 wt.% Pt, Pd and/or Rh (individually not above 2.5 wt.%), and 0–50 wt.% rare earths; followed by drying and calcining. The catalyst controls emissions of hydrocarbons, CO and NO<sub>x</sub>, and virtually eliminates H<sub>2</sub>S, while containing a minimal amount of Ni.

### Catalyst for Methanol and Formaldehyde Vapour Oxidation

FORD MOTOR CO.

*U.S. Patent 4,919,903*

A dispersed catalyst consisting of Pd with Rh and/or CeO<sub>2</sub> at a Rh:Pd wt. ratio of 0–0.3 and a CeO<sub>2</sub>:Pd wt. ratio of 0–50, is used for complete oxidation of CH<sub>3</sub>OH and/or HCHO vapour at 85–200°C, in the exhaust from a CH<sub>3</sub>OH fuelled I.C. engine calibrated for stoichiometric air:fuel mixtures. Gases having 0.01–1% CH<sub>3</sub>OH vapour and 0.001–0.05% HCHO vapour are more efficiently converted than by prior-art Ag/CeO<sub>2</sub> catalysts.

### Platinum Catalyst for Preparation of N-Alkyl-Anilines

CIBA-GEIGY CORP.

*U.S. Patent 4,921,980*

N-alkyl-anilines are prepared by reacting an aniline with an alcohol in the presence of H<sub>2</sub> and a catalyst at 150–300°C and 0.5–6 bar pressure. The catalyst consists of 0.2–10% Pt, 0.05–3% of a Group Ia and/or IIa metal compound, and at least one other compound on a SiO<sub>2</sub> gel carrier. The reaction can be continuous and gives high conversion and selectivity.

### Platinum or Palladium Catalyst for Wax Isomerisation

EXXON RES. & ENG. CO.

*U.S. Patent 4,923,588*

A wax isomerisation catalyst consists of Pt or Pd and 0.1–1.5 wt.% fluoride on an Al<sub>2</sub>O<sub>3</sub> or Al<sub>2</sub>O<sub>3</sub>-containing support in the form of 1/20 inch trilobes. Waxes are isomerised into hydrocarbons by passing over the catalyst in the presence of H<sub>2</sub>. The method is used for conversion of slack waxes from dewaxing hydrocarbon oils, or synthetic waxes from the Fischer-Tropsch process into liquid hydrocarbons boiling in the range 370+°C.

### Naphtha Reforming to Improve Gasoline Octane Value

UOP

*U.S. Patent 4,923,595*

Naphtha is reformed by contact with H<sub>2</sub> and a catalyst consisting of an Al<sub>2</sub>O<sub>3</sub> support with 0.05–1 wt.% Pt, uniformly dispersed; 0.1–2 wt.% Ge, Pb or Sn, uniformly dispersed; 0.1–2 wt.% Rh, Ir, Ru, Co or Ni, which is surface impregnated; and 0.5–1.5 wt.% Cl. The catalyst has dual hydrogenation/dehydrogenation and cracking functions, and is highly active, selective and stable.

### Hydrocarbon Reforming Process with Dual-Zone Catalyst

UOP

*U.S. Patent 4,929,332*

Gasoline range hydrocarbons are reformed in two sequential catalyst zones; the first having a catalyst composite with 0.01–2 wt.% Pt, 0.05–5 wt.% Ge, Al<sub>2</sub>O<sub>3</sub> and a Cl component, and the second catalyst composite having the same components, plus a promoter from Rh, Ir, Ru, Re, Co and/or Ni. This system gives improved yield of petroleum aromatics or gasoline products compared with a single catalyst system.

### Palladium Catalyst for Dimerisation of Aromatic Halogen Compounds

MITSUBISHI KASEI CORP.

*Japanese Appl. 2/53,742*

Aromatic halogen compounds having one or more halogen atoms on aromatic ring carbon(s) are dimerised by heating at 20–250°C, under ordinary pressure of 100 kg/cm<sup>2</sup>, with reducing agents, halogen absorbents, surfactants, water, and a supported Pd catalyst present at 0.1–30 mg Pd per mol of starting material. Aromatic dimers are used for various chemicals, for example, 3,4,3',4'-biphenyl-tetracarboxylic acid is useful for polyimide resins.

### Noble Metal Three-Way Catalyst with Zeolite Layer

TOYOTA JIDOSHA K.K.

*Japanese Appl. 2/56,247*

A three-way catalyst consists of a support having a zeolite coating, and an Al<sub>2</sub>O<sub>3</sub> coating loaded with (for example) 1.5 g/l Pt, 0.3 g/l Rh, 0.03 mol/l La, and 0.3 mol/l Ce. The catalyst is used to remove hydrocarbons, CO and NO<sub>x</sub> from combustion exhaust, and can remove hydrocarbons with higher efficiency at lower temperatures, even from fuel-rich combustion exhaust, by the action of the zeolite embedded in the catalyst.

### Preparation of Carbamic Acid Esters

BABCOCK-HITACHI K.K.

*Japanese Appl. 2/56,458*

Carbamic acid esters are prepared by reaction of amines or amino acids with CO, organic nitro compounds and organic hydroxyl compounds, at 60–230°C, using a catalyst of Pd, Rh or Ru on SiO<sub>2</sub> or Al<sub>2</sub>O<sub>3</sub> and an aqueous solution of hydrogen halides. The esters are prepared under mild conditions, in high yield, without using phosgene, and are useful for pesticides, isocyanates, and so on. Less catalyst is used and it is readily recovered.

### Combustion Equipment with Two Types of Rhodium Catalyst

TANAKA KIKINZOKU KOGYO

*Japanese Appl. 2/57,808*

Fuel such as town gas is fed into combustion equipment having an upstream catalyst with 5–50 nm grain diameter Rh, and a downstream catalyst having Rh of 0.05–2 μm grain diameter and 0.1–10 wt.% Ce to prevent Rh deactivation, with the catalyst dispersed on a stabilised-oxide coated support. The upstream catalyst promotes improved ignition performance.

## Exhaust Gas Purification Catalysts

MITSUI MINING & SMELTING

*Japanese Appl. 2/74,530*

Exhaust gas purification catalysts with good catalytic properties are prepared by immersing ceramic supports in Pt salt solutions prepared by adding dinitrodiamino Pt to a  $\text{HNO}_3$  solution, under pressure at 100–160°C. The Pt salt solutions are adsorbed efficiently on the supports and then reduced.

## Oxidation Catalyst for Exhaust Purification

MATSUSHITA ELEC. IND. K.K.

*Japanese Appl. 2/75,348*

The catalyst consists of a honeycomb structure, a perovskite structure composite oxide of formula  $\text{ABO}_3$ , where A is at least one of La, Ce and Sr, and B is Co and/or Ni, mixed with an inorganic binder, and at least one of Pt, Pd and Rh. The catalyst carrier produced has a larger surface area, enabling the catalytic substance to be homogeneously dispersed and tightly held. The catalyst is used to oxidise CO and hydrocarbons in exhaust gas to  $\text{CO}_2$  and water.

## Particulate Oxide Catalyst Filter for Diesel Exhaust

SAKAI CHEMICAL IND. K.K. *Japanese Appl. 2/102,315*

A particulate oxide catalyst filter is obtained by supporting Pt, Pd, Mn oxide, Cr oxide or Fe oxide on a thin metal netting or plate which may be of stainless steel, and has many small holes of diameter  $\geq 30 \mu\text{m}$ . Waste gas from diesel engines is forcibly passed through a number of filters; particulates are stably removed over long periods, and an increase in pressure loss of the filter is prevented.

## Three-Way Catalyst with Improved Durability

TOYOTA JIDOSHA K.K. *Japanese Appl. 2/102,735*

A catalyst for purification of exhaust gas consists of a heat resistant carrier coated with an  $\text{Al}_2\text{O}_3$  layer containing Pd-Nd and Rh-La composite oxides obtained by coprecipitating Pd-Nd and Rh-La, respectively. The catalyst is used for simultaneous removal of CO, hydrocarbons and  $\text{NO}_x$  from car exhaust gases, and has improved activity and durability, resulting in effective utilisation of the noble metals.

## Rhodium Solutions for Exhaust Catalyst Preparation

CATALER KOGYO K.K. *Japanese Appls. 2/102,736–37*

Rh-containing solutions are prepared by mixing Rh hydroxide crystals with either (a) weak basic nitrates selected from ammonium nitrate and rare earth metal nitrates, or (b) a water soluble organic acid having at least one carboxyl group, and dissolving in  $\text{HNO}_3$ , crystallising the  $\text{HNO}_3$  solution, and dissolving the resultant crystals in water or  $\text{HNO}_3$ . The Rh solutions are used to prepare waste gas purification catalysts, with higher efficiency.

## Exhaust Purification Catalyst with No Hydrogen Sulphide Generation

TOYOTA JIDOSHA K.K. *Japanese Appl. 2/107,334*

An exhaust gas purification catalyst consists of Pt, Pd or Rh supported on a metal oxide layer where Ce oxide exists on the surface of  $\text{Al}_2\text{O}_3$ , and a Ni-Ba composite oxide, with the oxide layer formed on a heat resistant substrate. The catalytic activity of the Ni is increased, and  $\text{H}_2\text{S}$  generation is prevented. In an example the catalyst showed 98%, 100% and 97% removal of hydrocarbons, CO and  $\text{NO}_x$ , respectively.

## Ruthenium Catalysts for Preparation of Perfumed Products

KAO CORP. *Japanese Appls. 2/108,642 and 2/121,938*

Catalysts consisting of 5 or 7% Ru on active C are used in hydrogenation reactions for the production of (a) 2-cyclohexylpropanol from 2-phenylpropanol or 2-phenylpropanal, or (b) a substituted cyclopentane-2-ol from the corresponding cyclopentane-2-one. A basic aqueous solution of pH 8.0–10.5 is added to the reaction medium or is used to wash the Ru catalyst. Product (a) can be used as a perfume and can be obtained in high yields, while product (b) has a woody odour, and can be produced industrially in high yields, in a short time.

## Platinum-Loaded Catalyst Supports for Combustion

TANAKA KIKINZOKU KOGYO

*Japanese Appl. 2/115,040*

Catalyst supports for combustion are prepared by immersing  $\text{Al}_2\text{O}_3$  fibre laminated supports in an  $\text{HNO}_3$  solution of dinitrodiamine Pt to which reducing agent is added, fixing Pt, drying and firing. Small Pt particles are loaded uniformly on the catalyst supports, which can be used for burners in which gas fuels or vaporised liquid fuels are burnt at low temperatures.

## Production of Hydrogen-Containing Gas for Car Fuel

MITSUBISHI HEAVY IND. K.K.

*Japanese Appl. 2/116,603*

$\text{H}_2$ -containing gas is produced by reacting  $\text{CH}_3\text{OH}$  with  $\text{O}_2$ -containing gas at 100–600°C, using a catalyst of Pt and/or Pd on a support preferably containing 10–98 wt.% of rare earth element oxides, selected from  $\text{La}_2\text{O}_3$ ,  $\text{CeO}_2$ ,  $\text{Nd}_2\text{O}_3$  or mixtures. The gas can be produced at low temperature, with good selectivity, and stability over a long time.

## Production of Nucleosides

AJINOMOTO K.K.

*Japanese Appl. 2/117,689*

Production of 2',3'-dideoxynucleosides is effected by converting a nucleoside into an intermediate compound, and then reducing in an aqueous organic solvent in the presence of a Pd catalyst and a base, under an atmosphere of  $\text{H}_2$ . The products are prepared in high yield with high selectivity using this process.

### Curable Fluorosilicone Composition

SHINETSU CHEM. IND. K.K. *Japanese Appl.* 2/123,163

A curable fluorosilicone composition consists of 100 parts wt. of an organopolysiloxane, an organohydrogensiloxane, 0.01–10 parts wt. of another organopolysiloxane, and a catalytic amount of Pt, Pd or Rh series compound. The composition has high heat resistance, and is used for potting and coating of electric and electronic parts.

### Preparation of Aromatic Urethanes

SUMITOMO METAL IND. K.K.

*Japanese Appl.* 2/124,865

Aromatic urethanes are prepared by reaction of an aromatic nitro compound with CO and a hydroxy-containing organic compound, in the presence of a Pd or Ru catalyst fixed in a reactor, a Lewis acid promoter such as FeCl<sub>3</sub>, and a N-containing heteroaromatic compound as ligand. Aromatic urethanes can be prepared without use of phosgene, without recovery, drying and reactivation of the platinum group metal, and with little metal loss.

### Ammonia Converter with Increased Reliability

TEKHENERGOKHIMPROM. *Russian Patent* 1,493,303

An NH<sub>3</sub>-air mixture is fed to an NH<sub>3</sub> converter having a vertical cylindrical body and containing a Pt catalyst mesh. Oxides of nitrogen are formed, which are fixed by cooling, and used to make dilute HNO<sub>3</sub> with increased reliability.

## HOMOGENEOUS CATALYSIS

### Visible Radiation Activated Hydrosilylation Reaction

MINNESOTA MINING MFG. CO.

*European Appl.* 358,452A

A hydrosilylation process comprises reacting an unsaturated aliphatic compound and a composition containing at least one Si-bonded H in the presence of a Pt complex and a sensitiser. The sensitiser absorbs visible light on exposure and transfers energy to the ( $\eta^5$ -cyclopentadienyl) tri ( $\sigma$ -aliphatic) Pt complex so that reaction is initiated. The method is used for visible light curable impression material for dental applications, and enables use of a heat-sensitive substrate, and safer visible radiation.

### Alkadienol Production with Recirculating Palladium Catalyst

MITSUBISHI KASEI CORP. *European Appl.* 361,304A

Alkadienols are produced by reaction of a conjugated alkadiene and water in the presence of CO<sub>2</sub> and a catalyst consisting of a Pd compound and a phosphine or phosphite. The method efficiently separates high boiling point by-products from the Pd catalyst, which is then recirculated into the reaction system with higher activity. Alkadienols are produced, which are hydrated dimers of a conjugated alkadiene.

### Homogeneous Rhodium Hydrogenation Catalyst

RANBAXY LAB. LTD.

*U.S. Patent* 4,902,447

$\alpha$ -6-Deoxytetracycline derivatives are prepared by hydrogenation of substituted methylenetetrahydrocyclohexylidene derivatives in the presence of a bis(triphenylphosphine) (hydroxylamine hydrohalide) dichloro Rh catalyst. The products are obtained in high yields and purity, and include the known antibiotic doxycycline. The process is more economical than known processes as less Rh is used for the catalysts.

### Preparation of $\alpha$ -Phenyl Propionic Acid Derivatives

DAICEL CHEM. IND. K.K. *Japanese Appl.* 2/48,544

$\alpha$ -Phenylpropionic acid derivatives are prepared by reacting an  $\alpha$ -phenylethyl alcohol derivative with CO, at 30–130°C, in a mixture of a hydrocarbon and an  $\alpha$ -phenylpropionic acid derivative, in the presence of a Pd, Co or Ni compound as catalyst, and preferably a cocatalyst such as I, HI, or alkyl iodide. The products have analgesic, anti-inflammatory and antipyretic activities, and can be produced in high yield by this process.

### Preparation of Indole-Carboxylic Acid Esters

NIPPON STEEL CHEM. K.K. *Japanese Appl.* 2/73,060

Indole-7-carboxylic acid esters are prepared by reaction of dihydro-indolyl thallium bis-trifluoroacetate with CO in a lower alcohol in the presence of Pd acetate. The indole esters are useful as intermediates in the preparation of drugs and agrochemicals, and can be produced from indolines in high yield and regiospecifically by this short process.

### Palladium Catalyst for Preparation of Indole Compounds

NIPPON STEEL CHEM. K.K. *Japanese Appl.* 2/73,061

Indole compounds are produced by reacting a halogeno-indole with an olefin in the presence of 0.3–50 mol.% of a Pd catalyst such as Pd acetate or Pd chloride, a triarylphosphine and a base. The reaction is carried out in a solvent at 80–140°C, for 0.5–48 h. The process produces indole compounds easily with low cost; which are useful as a starting material for pharmaceuticals or agrochemicals.

### Rhodium Complex Catalyst for Selective Preparation of Silanes

TOSHIBA SILICONE K.K. *Japanese Appl.* 2/96,583

Aminoalkylalkoxysilanes useful as glass-plastics binders are prepared by reaction of silane compounds with allylamines in the presence of a Rh complex catalyst having N and/or S containing heterocyclic compounds as ligands. The products are prepared selectively using the Rh complex catalyst, which can be prepared readily from the Rh complex and ligands in situ. An example of the Rh complex is bis(1,5-cyclooctadiene) Rh(I) tetrafluoroborate.

## Palladium Catalyst for Preparation of Polymerisable Monomers

mitsui petrochem. ind. k.k.

*Japanese Appl. 2/111,767*

Preparation of 1,3-dioxolan-2-one derivatives is by hydrogenation of 4,5-dihalo-1,3-dioxolan-2-one derivatives at 20–70°C, under atmospheric pressure to 10 kg/cm<sup>2</sup>, in the presence of a Pd catalyst (Pd at 0.1–3 wt.% of starting material), aliphatic tertiary amines and alkali metal compounds.

## Palladium Complex Carbonylation Catalyst

nippon petrochem. k.k. *Japanese Appl. 2/117,636*

A mixture of two or more unsaturated hydrocarbons is reacted with CO and water or a lower alcohol at 40–250°C, with 10–600 kg/cm<sup>2</sup> of CO pressure, in the presence of a carbonylation catalyst such as bistriphenylphosphine dichloro Pd. Selective hydrocarboxylation or hydroesterification of the vinyl radical produces  $\alpha$ -aryl propionic acid derivatives or their esters, which are intermediates for production of  $\alpha$ -(4-isobutylphenyl) propionic acid (Ibuprofen).

## Platinum Group Metal Hydrogenation Catalysts

central glass k.k. *Japanese Appl. 2/121,952*

Halomethyl-nitrobenzenes undergo fluorination and hydrogenation by reaction with HF and H<sub>2</sub> in the presence of a hydrogenation catalyst, to give the 4-fluoroaniline derivative. The catalyst may be Pt, Pd, Rh, Ir, Os or Ru in the form of metals, oxides, halides or hydroxides. The reaction yield and position-selectivity are high, giving products useful as intermediates for bactericides, herbicides and medicines.

## Improved Preparation of Phthalides

mitsubishi kasei corp. *Japanese Appl. 2/121,976*

Phthalide(s) are prepared by hydrogenation of aromatic ortho-dicarboxylic acid(s) or their anhydride(s) in the presence of a catalyst of Ru, organophosphines, and conjugated bases. The phthalides are prepared under mild conditions in high and steady yield (60–90%), and are useful as intermediates for naphthalenes, anthracenes and certain alkaloids. The catalyst does not cause corrosion of the apparatus and shows steady, high activity for a long time.

## Hydrogenolysis of Carbonyl Protective Groups on Peptides

berlin chemie veb. *East German Patent 274,822*

Carbonyl protecting groups on amino acid and peptide derivatives can be removed by hydrogenolysis without affecting sensitive histidine and tryptophan components. Hydrogenolysis is in an organic solvent, under a H<sub>2</sub> pressure of 1.5–50 bar, with a Pd catalyst present at 1–6 mg Pd per mmol of amino acid or peptide derivative; itself present at 200–600 mmol/l.

## FUEL CELLS

### Amorphous Alloys as Reversible Hydrogen Storage Media

standard oil co. (ohio) *U.S. Patent 4,923,770*

Amorphous alloys for reversible H<sub>2</sub> storage contain Pt, Ag and/or Hg; Ru, Fe, Ni, Al, Co, Mo, Mn and/or others; and Zr, Ti, Cd, Ca, Mg and/or others. A reversible H<sub>2</sub> storage electrode for use in alkaline or acid electrolyte can be formed using the alloy as a thin film or powder on a Ti or Ta substrate. The alloys can be repeatedly cycled without becoming embrittled or phase separated, oxidised or corroded.

### Methanol Fuel Electrode Catalyst Containing Platinum and Ruthenium

matsushita elec. ind. k.k.

*Japanese Appl. 2/51,865*

A new method for preparing a catalyst for the CH<sub>3</sub>OH fuel electrode of a fuel cell involves attaching highly dispersed Pt and Ru on C fine particles. Suspended, highly dispersed C fine particles are ultrasonically blended into a colloidal liquid containing dispersed Pt and Ru, and then the catalyst particles are filtered, washed, dried, and heat treated at 200–500°C in air. An electrode with improved capability can be prepared by a simplified process.

### Electrocatalyst for Methanol Fuel Cells

matsushita elec. ind. k.k.

*Japanese Appl. 2/111,440*

An electrode catalyst for use in fuel cells is prepared by supporting noble metal particles (including Pt) on a C powder support using an alcohol as reducing agent, and 5–10% H<sub>2</sub>O<sub>2</sub> as reaction promoter. The catalyst can be used for a CH<sub>3</sub>OH fuel cell, in which case Pt and Ru are solid-melted to give an alloy on the C, giving improved CH<sub>3</sub>OH oxidation potential.

### Combustion Catalyst for Fuel Reformer

fuji electric mfg. k.k. *Japanese Appl. 2/111,601*

A fuel reformer has parallel tubes with a reforming catalyst such as a Ni system on the inner face and a combustion catalyst such as Pt or Pd on the outer face. In the reformer natural gas and CH<sub>3</sub>OH are reacted with steam, and H<sub>2</sub>-rich reformed gas is produced for use in a fuel cell.

## GLASS TECHNOLOGY

### Platinum Bushings for Glass Fibre Spinning

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 the bushing plate being reinforcedly supported from the underside by a support of Si<sub>3</sub>N<sub>4</sub> having a surface coating of Al<sub>2</sub>O<sub>3</sub> or ZrO<sub>2</sub> film. This support has high material strength and excellent durability.

## ELECTRICAL AND ELECTRONIC ENGINEERING

### Corrosion Resistant Permanent Magnet

SUMITOMO SPEC. METAL K.K.

*European Appl.* 361,308A

A permanent magnet consists of a sintered body of 10–30 at.% rare earth metals, 2–28 at.% B and 65–80 at.% Fe, with the surface having a layer of Pt, Pd, Au and/or Ag, an electroless layer of Ni, Cu, Sn and/or Co, and an adherent electroplated layer of Ni, Cu, Sn and/or Co. The magnet has high corrosion resistance and stability, showing up to 5% deterioration in properties after 500 h at 80°C and 90% relative humidity.

### Thin Film Amorphous Alloy

MITSUI PETROCHEM. IND. K.K.

*European Appl.* 364,631A

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

### Magneto-Optical Recording Element Having Palladium Layers

EASTMAN KODAK CO.

*European Appl.* 367,685A

A magneto-optical recording element includes a substrate on which is a layer of magneto-optical medium consisting of alternating layers of Co and Pd (>6 Å thick). The element gives an increased carrier to noise ratio, and requires less materials and manufacturing time than conventional magneto-optical recording elements.

### Stable Electrolytic Capacitor Containing Palladium

MATSUSHITA ELEC. IND. K.K.

*European Appl.* 372,519A

A solid electrolytic capacitor includes a dielectric oxide film, a solid electrolyte layer, and a C layer, with a cathode layer and/or conductive adhesive consisting of a polymer and a Pd-containing electrically conductive powder. By using the Pd powder a small initial  $\tan \delta$  value is obtained which is stable at high temperatures and humidities, as well as a high resistance to short circuit failures.

### Thick Film Thermistor Composition

DU PONT DE NEMOURS CO. U.S. Patent 4,906,406

The composition consists of an admixture of finely divided particles of a Ru based pyrochlore and a borosilicate glass or glass mixture which has a viscosity of 10–10000 poises upon firing at 700–1000°C. Novel compositions have a good temperature range, a high positive temperature coefficient of resistance, and give a wide range of resistance values.

### Oxidation Resistant Rare Earth Permanent Magnet

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

A rare earth permanent magnet consists of a matrix of a rare earth-Ru-transition metal phase, dispersed in which is a rare earth-transition metal-B tetragonal magnetic compound. The magnet is made by magnetic moulding a starting powder which is a mixture of the magnetic compound and the matrix.

### Fine Ruthenium Oxide Particles for Resistance Pastes

TANAKA RIKINZOKU KOGYO

*Japanese Appls.* 2/88,431–32

Ru oxide fine particles are prepared by neutralising an acidic aqueous solution of Ru chloride with aqueous  $\text{NH}_3$  or ammonium solution, and converting Ru hydroxide into Ru oxide. The particles obtained have a spherical shape, and a sharp particle size distribution, with 70% having sizes 0.2–0.3  $\mu\text{m}$ , and are used in resistance pastes for thick film circuits.

### Ferromagnetic Thin Film for Magnetic Head

HITACHI K.K.

*Japanese Appl.* 2/90,505

A ferromagnetic thin film consists of an Fe-B alloy containing 1 at.% < B < 5 at.% and balance Fe, and preferably containing 0.5–1 at.% of at least one of Pt, Pd, Rh, Ir, Os, Ru, Au and Ag. The thin film is used for magnetic head core material of magnetic disk devices or VTR's, having a low magneto-strain constant, high saturation magnetic flux density and high permeability.

### Magnetic Recording Medium with Cobalt-Phosphorus-Platinum Layer

MITSUBISHI KASEI CORP. *Japanese Appl.* 2/108,221

A magnetic recording medium consists of a Co-P type magnetic layer which includes 0.01–10 wt.% Pt (with respect to the Co), on a non-magnetic substrate. Coercivity of the medium is enhanced, and high density recording can be obtained.

### Catalyst Coated Plastic Fibre Mat for Screening

ASEA BROWN BOVERI A.G. *German Appl.* 3,840,200

Mats for screening and dissipating any static charges are made of non-metallic fibres, such as plastic fibres, which are at least partly coated with a Pd catalyst layer and lined with a Cu film 0.1  $\mu\text{m}$  thick by a currentless technique.

### Electroconductive Paste for Metallising Ceramics

V.S. KOSTROMAROV

*Russian Patent* 1,485,315

An electroconductive paste contains 48–65 wt.% Pt-Pd alloy powder, 0.1–1.0 wt.%  $\text{MnCo}_3$ , ethyl cellosolve, ethyl cellulose, white spirit, pine oil and triethanolamine. The paste is used for metallising non-fired Bi containing ceramic articles.

## MEDICAL USES

### Stable Cisplatin Solution for Parenteral Administration

BRISTOL-MYERS SQUIB. *European Appl.* 369,714A  
A stable aqueous solution of cisplatin in a sealed container contains up to 1 mg of cisplatin and a source of chloride ion equivalent to 20–100 mg of NaCl per ml of solution. It contains less aquated Pt species and is of pH 5–7.5 which is closer to physiological pH than known solutions. The cisplatin can be parenterally administered and is an important anti-neoplastic agent used for treating metastatic testicular, ovary and advanced bladder cancer.

### New Platinum Anti-Tumour Agent with High Therapeutic Index

S.S. PHARMACEUTICAL K.K. *European Appl.* 376,076A  
A new Pt complex possessing excellent anti-tumour activity has 1,2-diaminocyclohexane as a ligand in the *cis*, *trans*-1, *trans*-d- or *trans*-dl-configuration. The complex may be used in the treatment of genital cancer, bladder cancer, or head and neck cancer, and has a high therapeutic index, good water solubility, and may be administered as an anti-tumour agent at a daily dose of 1–50 mg/kg orally, or 0.5–18 mg/kg parenterally.

### Polysaccharide Anti-Cancer Agent' Containing a Platinum Complex

KURARAY K.K. *World Appl.* 90/3,402A  
New derivatives of activated polysaccharides and their pharmaceutically acceptable salts consist of a polysaccharide containing -SO<sub>3</sub>H, -COOH, or -P(O)(OH)<sub>2</sub> acidic groups, bound to which are complexed (*trans*-1,2-cyclohexanediamine) Pt groups. The derivatives are anti-cancer agents with a reduced tendency to cause vomiting.

### Medical Preparation Prepared Using Palladium Complex Catalyst

YAMASA SHOYU K.K. *World Appl.* 90/5,526A  
A pharmaceutical preparation contains as active component a 2-alkynyladenosine prepared by reaction of 2-bromo-adenosine or 2-iodo-adenosine with a 1-alkyne in the presence of cuprous iodide and bis(triphenylphosphine)-Pd dichloride. The preparation is used in the treatment and prophylaxis of ischemic disease of the heart and brain.

### Boron-Free Palladium Dental Alloy

PIERCE & STEVENS CO. *U.S. Patent* 4,917,861  
A dental alloy having exceptional high temperature strength consists of 50–85 wt.% Pd, 5–40 wt.% of Co and/or Cu, 1–15 wt.% Ga, up to 5 wt.% of a modifier of Ru, Au, Ni, In, Sn and mixtures, 0.01–0.05 wt.% of an O<sub>2</sub> scavenging component from Ge, Li and mixtures, and up to 0.5 wt.% of a grain refiner from Ir, Re and mixtures. The novel alloy can be used for dental restorations and has high tarnish resistance.

### Novel Platinum Compounds with Potent Anti-Tumour Activity

TORAY IND. INC. *Japanese Appl.* 2/32,086  
New Pt containing compounds may be prepared by reacting a compound such as dinitrato (1,2-diaminocyclohexane)Pt(II) and an alkali/alkaline earth metal hydroxide with another compound. The new compounds exhibit potent anti-tumour action in a test using mice inoculated with leukaemia L1210.

### New Anti-Oncotics with Low Nephrotoxicity

TANABE SEIYAKU K.K. *Japanese Appl.* 2/67,217  
New anti-oncotics contain an organoplatinum complex, for example a substituted malonate *trans*-L-1,2-diaminocyclohexane Pt, as effective component. The anti-oncotics show good action against solid tumours, ascites hepatoma and leukaemia; inhibit propagation of tumour cells, and extend the survival period of animals with these tumours. The organoplatinum complexes have a wide range of anti-oncotic effects for various tumours, and low nephrotoxicity.

### Metal Material for Dental Use

TOKURIKI HONTEN K.K. *Japanese Appl.* 2/142,710  
An alloy consisting of 10–25 wt.% Au, 15–35 wt.% Pd, 47–70 wt.% Ag and 0.1–5 wt.% of one or more of Sn and In is made into a plate 0.05–0.5 mm thick. Fe powder of diameter 0.04–0.8 mm is applied on one surface and pressed, and dissolved to make an uneven phase. The material has excellent adhesion strength, processability, support strength and durability, and is used for stabilising teeth with mobility and for supplementing front teeth with a defect.

### New Platinum Complexes with Cytostatic Activity

BEHRINGWERKE A.G. *German Appl.* 3,834,098  
New Pt complexes with a 1,3-diaminopropane derivative as ligand have cytostatic activity and low cytotoxicity. The Pt complexes possess cytostatic activity as shown in "in vivo" tests in mouse L1210 leukaemia cells, B16 melanoma, and M5076 reticulum cell sarcoma, and are also effective against resistant tumour cells.

### Palladium-Silver Alloy for Dental Use

DEGUSSA A.G. *German Appl.* 3,905,987  
A Pd-Ag alloy used as a tooth replacement consists of 45–80 wt.% Pd, 7–45 wt.% Ag, 6–2 wt.% Pt, 0–1 wt.% Ru, Ir and/or Re, 0–5 wt.% Au, 0–5 wt.% Sn, 0–5 wt.% In, 0–3 wt.% Zn, 0–2 wt.% Cu, 0–1 wt.% W, Mo and/or Ta, 0–7 wt.% Ga, 0–5 wt.% Co, and 0–3 wt.% Ge. The alloy can be fired with dental ceramics without colouring them.

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