Reduction in the Effective Barrier Height in PtSi-p-Si Schottky Diodes by Using Low Energy Ion Implantation

C.-Y. WEI, W. TANTRAPORN, W. KATZ and G. SMITH, *Thin Solid Films*, 1982, **93**, (3/4), 407–412

A reduction in the effective barrier height in a PtSi-p-Si Schottky diode was achieved by low energy implantation, to introduce a shallow Pt layer on a p-Si substrate. After the Schottky diode was implanted with 3 keV $^{11}B^+$ ions to a dose of 4×10^{12} ions/cm^2, the barrier height was observed to decrease from 0.26 to 0.16 eV.

Preparation of a RuO_2-Modified Semiconductor Oxide Surface. An Optimization Procedure of Interest in Energy Conversion Systems

I. D. BURKE, J. F. HEALY and O. NI DHUBHGHAILL, *Surf. Technol.*, 1982, **16**, (4), 341–347

A simple procedure is described for modifying the surface of a semiconducting or insulating oxide powder (such as TiO_2) by the adsorption of $RuCl_3$ from isopropanol solution. Adsorption at monolayer and submonolayer level was readily achieved, 1 g of Ru being uniformly dispersed as $RuCl_3$ or RuO_2 over 9000 m^2 of the surface of a TiO_2 support. Heating the powder in air at 425°C resulted in the formation of a RuO_2-modified surface. The surface-bonded RuO_2 groups were shown to be active with respect to catalytic oxidation reactions, and repeated runs with the same catalyst confirmed the stability of the RuO_2 linkage to the oxide support.

Strange Temperature Characteristics of RuO_2-Based Thick Film Resistors

T. INOKUMA, Y. TAKETA and M. HARADOME, *Electrocomponent Sci. Technol.*, 1982, **9**, (3), 205–207

For some thick film resistors with conductive element RuO_2 and having almost zero TCRs, the electrical properties can be improved by doping with MnO_2. These MnO_2 doped resistors have low TCR which is constant from low to high resistivity. The glass frits the resistors were made of was 52 PbO-35 SiO_2-10 B_2O_3-3 Al_2O_3 and RuO_2 was mixed into them in the ratio RuO_2:glass 55:50, 25:75, 15:85 and 10:90, all measured in wt.%.

MEDICAL USES

Synthesis and Antitumour Activity of Platinum Complexes Containing Neutral and Protonated Amine-Olefin Ligands

D. B. BROWN, A. R. KHOKHAR, M. P. HACKER, J. J. McCORMACK and W. M. STALICK, *Inorg. Chim. Acta, Bioinorganic Chem. Artic. Lett.*, 1982, **67**, (2), 45–52

A series of N-substituted allyl amines bound to Pt are reported. Under acidic conditions compounds of general formula (protonated amino-olefin) $PtCl_3$ are formed. All the complexes contain Pt-chloride bonds activated towards hydrolysis, and were examined for potential anti-tumour activity. Most of the protonated ligand complexes exhibited significant cytotoxicity against both *cis*-Pt sensitive and resistant L1210 leukaemia in cell culture.

NEW PATENTS

ELECTROCHEMISTRY

Electrolysis of Pure Water

CHLORINE ENGINEERS CORP. LTD.

British Appl. 2,094,835 A

Electrolysis of pure water may be carried out efficiently using a sulphonate group-containing cation exchange membrane between the anode and cathode compartments. Pt cathode catalysts and anodic catalysts of a platinum group metal or platinum group metal oxide are used in the cell.

Porous Catalytic Electrodes

INSTITUTE OF GAS TECHNOLOGY

U.S. Patent 4,328,287

Improved depolarisation and hence longer life is obtained for a catalytic gas flow electrode, for electrochemical and fuel cells, when a metastable colloid of electrochemically reducible or oxidisable gas bubbles is included in the electrolyte which flows through the electrode. O_2 in an electrolyte colloid flows through the Pt-catalysed O_2 electrode of an O_2–Zn electrochemical cell.

ELECTRODEPOSITION AND SURFACE COATINGS

Palladium-Nickel Alloy Electroplating Bath

LANGBEIN-PFANHAUSER WERKE A.B.

British Appls. 2,094,347/8 A

A plating bath which gives bright, grain-refined, Pd-Ni alloy deposits contains Pd and Ni in the form of amine salts, such as $Pd(NH_3)_4SO_4$ and $Ni(NH_3)_6Cl_2$ and acetylenealcohols, such as propargylalcohol, butanediol and hexinediol, as brighteners. In 2,094,348 A the brighteners used are acetylenic amines and/or an aminoalcohols in the form of a mixed crystal.

Ruthenium and Iridium Oxide Coatings on Semiconductors

M. GRAETZEL *European Appl.* 57,669

The corrosion of CdS and other semiconductor electrodes exposed to light is reduced by a transparent coating of Ru and/or IrO_2.

Electrolytic Deposition of Metal Electrodes on to Solid Electrolyte Substrates

B.B.C. BROWN, BOVERI AND CO. LTD.

U.S. Patent 4,326,930

A solid electrolyte is impregnated with a reducible metal salt, such as $Pt(NH_3)_2(NO_2)_2$ and $RhCl_3.3H_2O$, and then immersed in water so that an impressed current across the electrolyte reduces the metal ions and deposits them as a metal layer along the interface between the electrolyte and its cathode.

Electrodeposited Palladium Contact

INTERNATIONAL NICKEL CO. INC.

U.S. Patent 4,328,286

Electrical contacts having good oxidation-resistance, low transverse porosity and good slip wear resistance are obtained from a duplex system in which Pd is first deposited from an alkaline bath containing a Pd ammine complex and then from an acid bath containing a Pd nitrile complex.

Platinum Group Metal-Coated Electrode

DIAMOND SHAMROCK CORP. *U.S. Patent* 4,331,528

A barrier layer obtained by growing a surface oxide film on a valve metal substrate and then incorporating Rh and/or Ir oxides in the films provides improved anchorage for platinum group metal and platinum group metal oxide coatings. The barrier layer is effective with Ru oxide-Ti oxide coatings.

Palladium Alloy Electroplating

K.K. SUWA SEIKOSHA *German Offens.* 3,135,595/7

In an improved solution for the electrodeposition of a palladium-nickel alloy which contains (in terms of metal) 5–30 g/l palladium and 5–30 g/l nickel, the palladium is present as a tetraammine complex, e.g. $\{Pd(NH_3)_4Cl_2.H_2O\}$, which can be added in the crystalline form to maintain the bath concentration.

LABORATORY APPARATUS AND TECHNIQUE

Miniature Wire Coil Production

A-T-O INC. *British Appl.* 2,092,305 A

A coil, for instance for use in a catalytic gas sensor, is made by winding Pt or other wire (diameter 0.0001–0.005 cm) on to a mandrel made of Mo or another metal which can be dissolved without dissolving the wire. The wound wire is coated with ceramic, is fired and the mandrel destroyed.

Electrochemical Gas Sensor

COAL INDUSTRY (PATENTS) LTD.

British Appl. 2,094,005 A

Pt-Au or Pd catalyst electrodes are used in an electrochemical gas sensor which has a wicking arrangement to ensure adequate electrolyte flow to the electrodes. The sensor is primarily for use in safety monitoring, such as CO detection in mines.

I.C.E. Exhaust Gas Sensor

HITACHI LTD. *European Appl.* 57,899

A sensor which responds to a ratio leaner than the stoichiometric air : fuel ratio has first and second electrolyte layers with Pt electrodes on each side of each layer. The second layer is supplied with a voltage and acts as a pump cell to move O ions.

Liquid Chromatography

ENVIRONMENTAL SCIENCES ASSOCIATES

European Appl. 60,082

An amperometric cell for high pressure chromatography may be heated with Pd, Pd oxide or Pt wires and similar wires used on the electrodes.

Hydrogen Detector

GENERAL ELECTRIC CO. *U.S. Patents* 4,324,760/1

A compact film detector for measuring H_2 leakage and the rate of chlorophyll decomposition of H_2O has a base film 200–500Å thick of Ti, Au, Ag or another conducting material, an upper film of similar thickness, which either causes H_2 dissociation or acts as a H_2 diffusion barrier, for example of Pd and/or Pt (or their alloys) and an intermediate thicker film of polycrystalline TiO_2.

Oxygen Monitor

FLINDERS UNIVERSITY OF SOUTH AUSTRALIA

U.S. Patent 4,326,318

The temperature range of an O_2 sensor having Pd active electrodes, Pt reference electrodes and Zr-stabilised ZrO_2 electrolyte is extended by using a third electrode separated from the active electrode by the electrolyte and insulated from the reference electrode.

Gas Sensor Assembly

NIPPON SOKEN INC. *U.S. Patent* 4,327,054

A sensor for detecting O_2, CO and hydrocarbon in I.C.E. exhaust gas consists of two separated sintered bodies, for instance TiO_2, the first of which is catalysed by Pt or Pt-Rh. Two Pt electrodes span both sensor bodies and a third is connected only to the uncatalysed body. The design offers improved stability during handling.

Evaporated Electrodes for Zirconia Oxygen Sensors

GENERAL MOTORS CORP. *U.S. Patent* 4,327,122

The ZrO_2 substrate is heated and electrode metal, especially Pt and Pd, evaporated on to the surface from an adjacent helix. The helix conforms to the ZrO_2 surface and has electrode metal distributed along its length.

Evaluating Electroless Plating

TOKYO SHIBAURA DENKI K.K. *U.S. Patent* 4,331,699

A coulostatic method for measuring the speed of electroless plating uses a reference electrode which may be made of Pt, Pd, Rh, Ir, Cu or Ni and a counter electrode of Cu, Ni, Pd or Pt.

HETEROGENEOUS CATALYSIS

W-Containing Three-Way Catalysts

JOHNSON MATTHEY P.L.C. *European Appl.* 56,729

A three-way catalyst for the purification of exhaust gases from I.C.E. consists of a substrate, a refractory oxide layer, W and/or one or more W compounds and one or more platinum group metals. The claimed catalyst is less likely to convert N oxides to NH_3 and has improved conversion of hydrocarbons. The catalyst can be used over a wider range of operating conditions.

Selective Hydrocarbon Hydrogenation

EXXON RESEARCH & ENGINEERING CO. *European Appl.* 58,014

Pd or Pt deposited on a low acidity SiO_2 polymorph forms a particularly useful catalyst for acetylene and diene hydrogenation and gives less fouling by polymerisation than Al_2O_3-supported catalysts.

Ammonia Production Catalyst

BRITISH PETROLEUM CO. P.L.C. *European Appl.* 58,531

The combination of H_2 and N_2 to form NH_3 is catalysed by a graphite having a basal plane surface area of at least 100 m^2/g, a BET : basal surface ratio of 8 : 1 or less and a basal : edge surface ratio of at least 2 : 1. This graphite supports 0.1–50% of a heavier Group V, VI, VII, or VIII metal promoted with a Group IA or VIII metal. Preferably the active metals are Ru and Os promoted with Rb or K.

Hydroxylammonium Salt Production

BASF A.G. *European Appl.* 59,907

Problems arising from the presence of N oxides in waste gases from Pt-catalysed NO reduction are now overcome by the use of two reaction zones. The exhaust gases from the first reaction zone are reacted with H_2 in the presence of a fresh mineral acid solution containing suspended Pt catalyst.

I.C.E. Exhaust Gas Catalyst

STE. FRANCAISE DES PRODUITS POUR CATALYSE "PROCATALYSE" *European Appl.* 60,740

A new long-life triple catalyst for I.C.E. exhaust gas purification has a monolithic support on which is deposited an active phase comprising Ce, Fe, at least one of Pt or Pd, Ir or Rh and Ga and Y.

Mixed Oxide Catalyst

UNIVERSITY OF DELAWARE *U.S. Patent* 4,323,482

A catalyst composition which will withstand high temperatures and reducing atmospheres without objectionable crystal growth contains a reducible metal oxide and a non-reducible refractory metal oxide. The catalyst mixture is heat treated in a reducing atmosphere at a temperature 550–1000°C before use to cause inhibition or disruption of crystallite growth. Suitable reducible oxides include Ru, Rh, Pd, Pt, Ir, Os, Ag and Gd oxides and the refractory oxide La, Ce and other lanthanide metal oxides.

Exhaust Gas Purification Catalyst

U.O.P. INC. *U.S. Patent* 4,323,542

U, although inactive by itself, is an effective promoter for Rh and Pt and/or Pd catalysts used for three-component control of I.C.E. exhausts. The catalyst is especially effective when the exhausts have a high S content and when the engine is operated under fuel-rich conditions or under dynamic net oxidising conditions. The catalyst contains 0.001–0.5% Rh, 0.02–2% Pt and 0.01–10% U.

Catalysts for the Preparation of Diaminophenols

A.P. MISCHENKO ET AL *U.S. Patent* 4,323,708

Diaminophenols and diaminophenol dihydrochlorides useful in the production of dyes, herbicides and fungicides may be prepared in good yield by hydrogenating dinitrophenol on a membrane catalyst containing 90–98% Pd and 2–10% Rh or Ru. The process eliminates waste water formation.

Hydroconversion Catalyst

PHILLIPS PETROLEUM CO. *U.S. Patent* 4,324,647

A low-coking catalyst resistant to NH_3 and H_2S, which may be used to promote simultaneous hydrocracking, hydrodenitrogenation and hydrosulphurisation of a feedstock contains a zeolite, Zn and Ti promoted by other metals, such as Pt, Pd, Rh and Ru.

High-Activity Zeolite Conversion Catalysts

MOBIL OIL CORP. *U.S. Patent* 4, 324,696

Super-active conversion catalysts are obtained by treating the H_2 form of ZSM-12, ZSM-20 and ZSM-23 zeolites with steam followed by base exchange with an ammonium salt. The zeolites may be combined with Pt, Pd and other hydrogenation components.

Fluorided Cracking Catalyst

TEXACO INC. *U.S. Patents* 4,324,697/8

The zeolite and/or metallic component, such as Pt promoted with Sn, Ge or Re, of a mixed metal-zeolite reforming catalyst is treated with an aqueous solution containing a F compound to obtain, after drying and calcining, a catalyst yielding very high octane products.

Platinum-Rhodium Sulphite Solutions

JOHNSON MATTHEY P.L.C. *U.S. Patent* 4,324,700

The activity of Pt, Rh, Pd and other catalytic materials is improved when the catalysts are prepared by precipitating the metal hydroxide or hydrated oxide from an aqueous solution, collecting the precipitate and redispersing it in water, passing SO_2 through the dispersion to dissolve the hydroxide or oxide and then drying and firing the resulting solution on to a suitable support. Improved metal dispersion is obtained, enabling catalysts produced by the method to meet stringent regulations governing pollution control.

Rhodium-Molybdenum-Iron Catalyst

ETHYL CORP. *U.S. Patent* 4,328,129

Dimethyl ether and methanol are selectively obtained from systhesis gas by contact with a Rh-Mo-Fe/Al_2O_3 catalyst.

Ethylene Oxidation Process

MASSACHUSETTS INSTITUTE OF TECHNOLOGY *U.S. Patent* 4,329,208

A reactor for ethylene oxidation consists of cells containing a solid electrolyte, such as yttria-stabilised ZrO_2, coated on one side with a Ag-containing ethylene oxidation catalyst and on the other side with a Pt-containing catalyst for dissociating O_2.

Hydrotreatment Catalysts

C.I.E. FRANCAISE DE RAFFINAGE *U.S. Patent* 4,329,258

Catalysts which give improved yield of high octane products and which are also active for the isomerisation of alkylaromatic hydrocarbons contain 0.02–2% of a platinum group metal, such as Pt, 0.05–0.6% Sn and sufficient amount of a Group IA and IIA metal to obtain the ratio c:a of 0.2:10. The metals are supported on a halided refractory metal oxide.

Palladium Hydrogenation Catalyst

IMPERIAL CHEMICAL INDUSTRIES LTD. *U.S. Patent* 4,329,530

Pd supported to a penetration depth of less than 300 μm on a calcined refractory material of Ca aluminate having a Ca:Al ratio of 1:4 to 1:10 is a selective catalyst for the hydrogenation of highly unsaturated hydrocarbons, such as acetylene, in the presence of less unsaturated hydrocarbons.

Hydrogenation Catalyst

PHILLIPS PETROLEUM CO. *U.S. Patent* 4,331,562

A catalyst containing elemental Pd, elemental Ru and/or Pd compounds; and a La and/or Cr nitrate promoter is highly active for the hydrogenation of olefinically unsaturated compounds.

Storage of Horticultural Products

POLSKA AKADEMIA NAUK INSTYTUT KATALIZY I FIZYOCHEMII POWIERZCHNI *U.S. Patent* 4,331,693

The atmosphere surrounding fruit and vegetables being stored is circulated through a catalytic combustor outside the storage chamber in order to remove, by combustion, any ethylene in the atmosphere. The method which maintains the freshness of the produce, preferably uses a Pt catalyst activated by impregnation with oleic acid.

Ruthenium Catalysts for Methane Production

IMPERIAL CHEMICAL INDUSTRIES LTD. *U.S. Patent* 4,331,825

Supported Ru metal catalysts prepared by the reduction of carbonyl compounds give improved yields of CH_4 in hydrocarbon hydrocracking processes.

Metachlorinated Aniline Production

RHÔNE-POULENC AGROCHIMIE *French Appl.* 2,491,059

The selectivity of meta-chloroaniline production by the dechlorination of polychloroanilines over a platinum group metal/Lewis acid catalyst is improved by using a pressure of up to 3 bars. A typical catalyst consists of Pd on C and Al bromide.

Hydrogenation Reaction

WACKER-CHEMIE G.m.b.H. *German Offen.* 3,043,442

In a process for purifying the HCl formed by decomposition of ethylene dichloride, the contaminating acetylene is hydrogenated in the presence of a catalyst which is Pd or Pt supported on a SiO_2 or Al_2O_3 carrier of specified surface properties.

HOMOGENEOUS CATALYSIS

Ethanol Synthesis by Methanol Homologation

TEXACO DEVELOPMENT CORP. *European Appl.* 56,679

Methanol is reacted with CO and H_2 to give ethanol in the presence of a catalyst consisting of Ru, a Ru oxide or a Ru salt; a quaternary phosphonium or ammonium base or salt and a Co halide.

Ruthenium-Catalysed Ester Production

UNION CARBIDE CORP. *U.S. Patent* 4,323,513

The amount of methyl and ethyl ester produced by the reaction of CO and H_2 with glycol in a homogeneous liquid phase mixture containing a Ru carbonyl complex catalyst and an acyl compound is improved if the concentration of methyl ester, ethylene glycol ester and water in the reaction medium is maintained at less than 30 vol. %.

Palladium and Rhodium Porphyrin Catalysts

PCUK PRODUITS CHIMIQUES UGINE KUHLMANN *U.S. Patent* 4,323,515

The direct reduction of aromatic nitro derivatives to isocyanates by CO is effected with good yields when metal porphyrin catalysts, especially Rh and Pd porphyrins, are used. The catalyst may be synthesised in situ from a porphyrin and a metal black or chloride. This catalyst system, unlike the majority of conventional catalyst systems, does not cause the formation of azo derivatives.

Catalytic Photochemical Process for Splitting Water

STUDIENGESELLSCHAFT KOHLE m.b.H. *U.S. Patent* 4,325,793

The photochemical generation of H_2 from water may be speeded up by dissolving in the water a catalyst having a metal atom (which may be Pt, Pd, and Au, amongst others) linked to ligands via two S or one S and one N atom. One of the suitable catalysts listed is bis(cis-stilbene-dithiolato)Pt.

Asymmetric Hydrogenation of Prochiral Olefins

SNAMPROGRETTI S.p.A. *U.S. Patent* 4,328,364

A Rh cationic complex, such as Rh cyclooctadiene bis(methyl-benzyl)bis(diphenylphosphine) ethylenediamine, immobilised in a clay-like mineral (such as hectorite, bentonite or haloysite) is active for the hydrogenation of prochiral olefins.

Heat Curable Polysiloxanes

TOSHIBA SILICONE CO. LTD. *U.S. Patent* 4,329,275

An improved curing system for an organopolysiloxane containing both vinyl and H groups, which does not require the use of inhibitors, combines a small amount (0.000001–0.1 part) of a Pt compound, a P compound, and an organic peroxide. A typical cure system contains 2 parts $H_2PtCl_2.6H_2O$, 1.2 parts $P(OPh)_3$ and 4.5 parts dimethyl di(t-butylperoxy)hexane.

Hydroformylation of Olefins

SHELL OIL CO. *U.S. Patent* 4,330,678

Rh complexed with F-containing organic phosphites and/or arsenites gives increased yields of normal aldehydes from α- and β-olefins as well as other internal olefins when used as a catalyst in hydroformylation reactions.

Rhodium Phosphine Chiral Hydrogenation Catalysts

PROCTOR & GAMBLE CO. *U.S. Patent* 4,331,818

The chiral ligand bis(diphenylphosphino)cyclohexylethane, when complexed to Rh(I), functions as a superior chiral hydrogenation catalyst. The catalyst may be used to produce extremely pure alpha-acylamide-acrylic acids.

FUEL CELLS

Electrode Catalyst for a Fuel Cell

HITACHI LTD. *British Appl.* 2,095,025 A

The use of a Pt-Ru heavy metal catalyst, such as Pt-Ru-Re and Pt-Ru-Sn, in acid electrolyte fuel cells which are driven by methanol, ethanol, etc., overcomes passivation problems experienced when Pt electrode catalysts are used.

GLASS TECHNOLOGY

Tipless Orifice Plate for a Fibre Glass Bushing

STE VETROTEX SAINT GOBAIN *U.S. Patent* 4,328,015

Rows of high density orifices are located within channels in the orifice plate of a glass fibre bushing to assist even cooling of glass being fed to the orifices. Suitable dimensioning of the grooves enables glass fibres to be formed without flooding on the underside of the plate. A typical bushing plate is made from a Pt-10%Rh alloy material.

Fibre Glass Bushing

OWENS-CORNING FIBERGLAS CORP. *U.S. Patent* 4,330,312

The cost of a fibre glass bushing is reduced by constructing the bulk of the melt container from a block of refractory or ceramic material, such as Al_2O_3 or ZrO_2. The orifice section of the bushing is formed from a series of Pt-Rh or other Pt alloy plates located in the base of the block. Electric current is supplied to each of the orifice plates by adjustable terminal clamps.

ELECTRICAL AND ELECTRONIC ENGINEERING

I.C.E. Glow Plug

ROBERT BOSCH G.m.b.H. *British Appl.* 2,092,670 A

A glow plug which can ignite fuel within 2 s has a thin-walled ceramic tube in the longitudinal bore of a metal housing. The base of the tube is sealed and carries a Pt-Rh alloy heating element.

Memory Device

JOHNSON MATTHEY P.L.C. *British Appl.* 2,094,044 A

Individual segments on the card can be activated singly by externally applied signals to permanently record separate transactions. In a preferred form the individual segments are electrically activatable ECD cells containing metal oxides which colour cathodically by a reduction process. These oxides may be Ir, Rh or base metal transition metal oxides, such as W. Possible uses include credit payment at point of sale and on public transport.

Photoconductive Substrate

CANON K.K. *British Appls.* 2,095,030/1 A

Pt, Pd, Au and base metal may be used as a support layer for photoconductive amorphous Si material having varying O atoms. The photoconductive layer is mainly for use in solar cells.

Electrochromic Printing Head

INTERNATIONAL BUSINESS MACHINES CORP. *European Appl.* 56,453

A new form of print head has a housing of insulating material containing an array of spaced capillary tubes with an electrode in each tube. The electrode, of Pt, Ir, Rh or Au is formed as a coating on the inside of the tube, as a cylindrical wire or as a conductive filler. The new arrangement reduces the electrolytic erosion of the electrode.

Hydrogen Storage Material

MPD TECHNOLOGY CORP. *European Appl.* 56,724

A H_2 storage material is made by processing a hydridable material with a pore-forming material and a polymer, to fibrillate the polymer, and then removing the pore-forming material. The hydridable material may be Pd or its alloys or alloys of lanthanide metals.

Standby Batteries

ESB INTERNATIONAL CORP. *European Appl.* 60,642

An auxiliary Pt or Pd electrode is provided for a Pb-acid standby battery in float service to depolarise the negative electrode and allow the positive electrode to reach full charge.

Photosensors

HITACHI LTD. *European Appl.* 60,699

Photosensors are fabricated by forming a Si photoconductor film containing H_2 on a substrate, coating with a sputtered transparent conductive film and heating to 140–280°C. The sputtered film is preferably Pt, Ni, Al, Cr, Ta, Mo and/or Au.

Integrated Injection Logic I.C.s

INTERNATIONAL BUSINESS MACHINES CORP. *U.S. Patent* 4,322,883

Pd and Pt layers may be used to form metal silicide contacts on an integrated injection logic or a merged transistor logic I.C. produced by a process which achieves self-aligned metal-to-silicon contacts and submicron contact-to-contact and metal-to-metal spacing.

Semiconductor Pressure-Sensor

HITACHI LTD. *U.S. Patent* 4,322,980

A semiconductor pressure-sensor for use in automotive applications has a series of diaphragms and strain gauges on one single crystal chip which is bonded to a borosilicate glass substrate. Au wire bonding to the strain gauges is made via holes in the glass substrate which are metallised with a Au-Pd-Ti system.

Information Record

R.C.A. CORP. *U.S. Patent* 4,329,697

A flat glass disc is coated in turn with layers of a light reflective material, a dielectric layer highly transparent to light supplied by a recording laser and a thin layer of absorptive material, such as Rh or Ti. The coating parameters are chosen to establish an anti-reflection condition for the coated record blank at the recording light frequency.

Precision Capacitance Transducer

KAVLICO CORP. *U.S. Patent* 4,329,732

Two square plates of soda lime glass are spaced from each other and are sealed together by a ring of glass frit in an overlapping fashion. Thin conductive layers of screened Pd, Ag, Au or Pd-Ag alloy on the facing layers of the plates form a capacitor whose capacitance may be varied by application of pressure to the outside of the plates.

Electrical Contacts

METALLGESELLSCHAFT A.G. *German Offen.* 3,043,207

Low-loss contacts between conductors carrying large currents, such as in industrial electrolysis equipment, are obtained by forming sharp projections on at least one of the contacting surfaces and plating one or both of the surfaces preferably with Pt or Ag.

Electrical Contacts

SIEMENS A.G. *German Offen.* 3,045,784

A laser-beam procedure for obtaining metal silicide contact layers on an oriented silicon crystal surface is claimed where the silicide may be of Pt, Pd, Mo, W, Ti, Ta or Nb silicide.

MEDICAL USES

Platinum Antitumour Complexes

SHIONOGI & CO. LTD. *British Appl.* 2,091,731 A

Complexes with less nephrotoxity and higher water solubility than cisplatin have the formula $(NH_3)_2PtXY$ where X and Y are residues of hydroxycarboxylic acids or sugar phosphates, such as glucuronate.

Implantable Medical Lead

MEDTRONIC INC. *European Appl.* 57,877

An implantable lead has a polymer-based gel electrode held in a conductive container made of Pt, Pt-Ir, stainless steel, Ti or the like.

Electrode Cap

ELECTRO-CAP INC. *U.S. Patent* 4,323,076

Pt and Ag electrodes may be used in an E.C.G. electrode assembly having a disposable skin contact pad and a snap-on electrode system.

Platinum-Caffeine Anti-Cancer Complex

RESEARCH CORP. OF UNIVERSITY OF HAWAII *U. S. Patent* 4,325,950

Pt caffeine chloride anti-tumour compounds are prepared by reacting K_2PtCl_4 with caffeine in an aqueous solution at a neutral pH and at ambient temperature and pressure.

Mixed Amine Complexes of Platinum

JOHNSON MATTHEY & CO. LTD. *U.S. Patent* 4,329,299

Pt co-ordination compounds having straight chain, branched chain or cyclic aliphatic amine substituents, typically cis-dichloroammine-isopropylamine Pt (II), show reduced toxicity during the chemotherapeutic treatment of cancer.

cis-Diammine Diodoplatinum

M.P.D. TECHNOLOGY CORP. *U.S. Patent* 4,332,780

cis-$Pt(NH_3)_2I_2$ is prepared by adding aqueous NH_3 to an aqueous dispersion of K_2PtI_4 under controlled conditions of temperature and pH.

Anhydrous Chip

JOHNSON MATTHEY P.L.C. *German Offen.* 3,134,671

cis-Dichloro-trans-dihydroxy-bis (isopropylamine) Pt(IV) is useful for the treatment of cancer or malignant neoplasms. Hitherto, its preparation has resulted in formation of the 1:1 hydrate. The anhydrous form may now be prepared by oxidising the Pt(II) complex with peroxide and purifying via an adduct with dimethylacetamide.