NEW PATENTS

METALS AND ALLOYS

Manufacture of Finely Divided Particles of Silver-Palladium Alloys

E. I. DU PONT DE NEMOURS & CO.

U.S. Patent 5,429,657

Finely divided particles of Ag-Pd alloy are manufactured by aerosol decomposition of an aqueous solution containing Pd and Ag nitrates. The aerosol is heated to above the decomposition temperature of the Ag and Pd compounds, but below the melting point of the Ag-Pd alloy, to form a densified alloy, followed by separation of the Ag-Pd alloy particles. The powders are fully dense with high purity.

Ultrafine Palladium Alloy Particles

TANAKA KIKINZOKU KOGYO K.K.

Japanese Appl. 7/24,318

Ultrafine particles of Ag-Pd alloy are prepared by dissolving $Ag_2Pd(C_2O_4)_2$ in an aqueous solution containing polyvinylpyrrolidone (PVP) and irradiated by UV light in solution. The particles of the Ag-Pd alloy contain 50–80 at.% Ag, Ag-Pd alloy with an atomic ratio of Ag:Pt = 2:1, or Ag-Rh alloy with an atomic ratio of Ag:Rh = 2:1. In the production of ultrafine particles of Ag-Rh alloy, $AgRh(C_2O_4)_2$ is dissolved in an aqueous solution containing PVP and $NaBH_4$.

ELECTROCHEMISTRY

Palladium Surface Enriched Electrode

KOBE STEEL LTD. *Japanese Appl.* 7/26,390

Ti (alloy) electrode material comprises a layer enriched by a Pt group element, such as Pd, on its surface and an oxidised layer formed on the Pt group metal enriched layer. The electrode is used in sea water electrolysis and for the production of Cl_2. It has high corrosion resistance and high current efficiency.

Hydrogen Peroxide Production

MITSUBISHI GAS CHEM. CO. INC.

Japanese Appl. 7/33,410

Aqueous H_2O_2 is produced by reacting H_2 and O_2 in the presence of a Pt group metal catalyst, preferably Pd, which is chemically modified with at least one element selected from Pb, Zn, Ga or Bi, in a reaction medium containing a H_2O_2 stabiliser, such as aminotri-(methylphosphonic acid), 1-hydroxyethylidene-1,1-diphosphonic acid, ethylenediaminetetra(methylene phosphonic acid), or pyrophosphoric acid. No halogen ions are required in the reaction medium to promote the reaction of H_2 and O_2.

Ion Water Generation

BROTHER KOGYO K.K. *Japanese Appl.* 7/51,674

An ion H_2O generator is equipped with a pair of specific electrodes for H_2O electrolysis. The electrodes are made of Ti and are coated with a metal film, preferably Pt or Pt-containing alloy, containing a reduced amount of oxide impurities.

Electrode for Electrolysis

PERMELEC ELECTRODE LTD.

Japanese Appls. 7/62,583 and 7/62,585

An electrode assembly has contacting surfaces coated by Pt group metal or their oxides, thin film forming metal or a corrosion resistant conductive layer. The electrode consists of a base material, a coating layer of Pt group metal and at least one of Ti, Ta, Nb, etc., of thickness 10–200 μm. The electrodes can withstand alternating voltage and are assembled on a demountable fixture having little contact resistance, so are stable for long periods.

ELECTRODEPOSITION AND SURFACE COATINGS

Iridium-Coated Products

NIPPON ELECTROPLATING ENGINEERS K.K.

Japanese Appl. 7/34,289

Ir-coated products, for crucibles or electric contacts, comprise a base of W, Mo, Ta or their alloy, coated by an Ir layer. In an example, a W crucible was first coated with Pt which was then coated with Ir in a bath containing 10 g metal/l Na hexabromoiridium(III), 40g/l boric acid and 0.02 mol/l disodium maloate, at pH 5 and 85°C, and at 0.15 A/dm^2. The Ir layer was 8μm thick and was highly adhesive.

Palladium Electroless Plating Solution

KOJIMA KAGAKU YAKUHIN K.K.

Japanese Appl. 7/62,549

A Pd electroless plating solution contains 0.0001–0.5 mol/l of Pd compounds, 0.0005–8 mol/l NH_3 and/or amine compounds, 0.0005–5 mol/l aliphatic mono-, di- and/or polycarboxylic acids. High purity, stable and cracking free Pd plating is obtained with good coating and bonding abilities.

Polyimide-Metal Foil Composite Film

OKUNO PHARM. IND. K.K. *Japanese Appl.* 7/70,762

A Pd layer 3–400Å thick is formed by vapour deposition on one or both sides of an aromatic polyimide film, electroless plated and electroplated, with Cu for example, to yield a polyimide-metal foil composite film. The method is used for printed circuit boards. The polyimide-metal foil has excellent heat resistance, so high temperature treatment is possible.

Spherical Electroless Plating Powder

NIPPON CHEM. IND. CO. LTD.

Japanese Appl. 7/118,866

Spherical core material, such as resin, is coated with a 0.05–0.3μm thick layer of 7–15 wt.% Ni-P alloy. Pd ions are electroless plated on the surface of the core material by dispersing complexing agent in the core material slurry and in a plating bath, followed by ball mill grinding. A well dispersed spherical electroless plating powder, and a conductive material are obtained.

APPARATUS AND TECHNIQUE

Treatment of Acid Water

KURITA WATER IND. LTD. *Japanese Appl.* 7/80,473

The treatment of acid H_2O (1) containing H_2O_2 and surfactant comprises keeping (1) in contact with a Pt catalyst and with activated C. The method particularly treats rinsed drainage released from a semiconductor manufacturing plant. The Pt catalyst is applied to the acid region of pH 3 and almost completely decomposes and removes H_2O_2. The activated C efficiently absorbs and removes the surface active agent. The method is used to prepare ultrapure H_2O from waste H_2O semiconductor rinses.

Oxygen Recovery from Life Support System

DORNIER G.m.b.H. *German Appl.* 4,333,504

O_2 recovery from life support systems uses a low temperature catalyst, especially RuO_x/TiO_2, to convert CO_2 to CH_4 and to electrolyse H_2O. The electrolytic cell may have a KOH electrolyte, one containing H_3PO_4 or solid electrolyte; a proton-exchange membrane; or may be a molten carbonate cell. The recovery occurs at 20–200°C. Gas permeation to concentrate CO_2 uses a liquid membrane, or activated charcoal, adsorption/desorption with solid amine, etc., as adsorbent. The process is especially useful for space travel.

Gas Cleaning Apparatus

FUJITSU LTD. *German Appl.* 4,426,081

Gas cleaning apparatus incorporates rotating catalytic metal blades of Pt, Pd, Ru or Rh metal catalyst, within a housing where the housing wall incorporates a magnet which generates high density plasma. The apparatus treats industrial effluent and vehicle exhaust. Incoming gas impinges on the blades in the O_2-free environment. The combination of catalytic treatment and high density plasma generates synergy between the cleaning processes; and O_2-rich gases are cleaned.

JOINING

Platinum Material for Brazed Ornaments

TANAKA KIKINZOKU KOGYO K.K. *Japanese Appls.* 7/41,885–86

Pt brazing material comprises 0.01–1 wt.% of at least one of Ti, Zr, Hf and rare earth elements, and balance Pt. It may also contain elements, such as Y, Sm, Eu and Er. The materials are used for ornaments having high hardness.

HETEROGENEOUS CATALYSIS

But-2-ene-1,4-diol Production

BASF A.G. *European Appl.* 646,562A

But-2-ene-1,4-diol is produced by selective hydrogenation of but-2-yne-1,4-diol in aqueous solution on a Pd-containing solid-bed catalyst, which is doped with Pb or Cd. The catalyst is obtained by successive vapour-phase deposition or sputtering of Pd, and Pb or Cd, onto a metal wire mesh or metal foil support, then formed in air at high temperature. There is minimal by-product formation.

Preparation of Unsaturated Glycol Diester

MITSUBISHI CHEM. CORP. *European Appl.* 647,611A

Unsaturated glycol diesters are prepared by reacting a conjugated diene with a carboxylic acid and O_2 over a Pd and Te catalyst supported on solid SiO_2, where 80% of the pore volume has a radius of 5–50 nm, relative to the total volume of pores of radius 1.8–10,000 nm. The process can be performed industrially and deactivation rates for > 3900 h of 0.42 can be obtained.

Dehydrogenation of Gas Streams

HALDOR TOPSØE A.S. *European Appl.* 655,431A

H_2 is removed from a HC-dehydrogenation reaction effluent by mixing with an O_2-containing gas and reacting over a catalyst containing a noble metal or its alloy in massive form. In an example, Pd and 70%Pd-Ag alloy catalysts were used as flakes with a size of 16 cm^2/g metal, and 0.5 g of this catalyst was loaded in a quartz tubular reactor. The process gives complete removal of H_2.

Catalyst for Purification of Engine Gases

CATALER IND. CO. LTD. *European Appl.* 657,204A

A catalyst for purification of engine exhaust gases comprises a support of TiO_2-Al_2O_3, ZrO_2-Al_2O_3 or SiO_2-Al_2O_3 carrying a N oxide adsorbent which may be alkali metal(s), alkaline earth metal(s), etc., and a Pt group metal catalyst, selected from Pt, Pd and Rh. The catalyst inhibits poisoning from S oxides, and N oxides can be purified even during engine operation in the fuel-lean mode.

Exhaust Gas Purification Catalyst

TOYOTA JIDOSHA K.K. *European Appl.* 658,370A

A catalyst is produced by loading an N oxide adsorbent on a porous support, carbonating the support with the adsorbent, which is an alkali metal compound, etc., to convert it to carbonate, and loading a Pt, Pd or Rh metal catalyst onto the support. NOx can be effectively purified in exhaust gases that contain O_2 concentrations at stoichiometry, or higher concentrations than needed for oxidising CO and HC.

Catalyst for Exhaust Emission Control

HONDA MOTOR CO. LTD. *World Appl.* 95/9,048A

An exhaust emission control catalyst has θ- and α-phases, and is made of modified Al_2O_3 with an α ratio of 0.5–95% and a catalytic metal, such as Pt, carried on the modified Al_2O_3. In addition, a catalyst with improved NOx cleaning capability is constituted by using the above catalyst as a catalytic element and aluminosilicate or CeO_2.

Three-Way Catalyst

ALLIED-SIGNAL INC. *World Appl.* 95/9,687A

CO, HC and NOx are removed from the exhaust gases of lean burn diesel and other engines, containing O_2 in excess of the stoichiometric amount needed for complete combustion, by contact with a Pt and/or Pd catalyst, preferably Pt, supported on Al_2O_3, CeO_2 and Ba sulphate, SiC, ZrO_2, SiO_2, TiO_2, etc. The catalyst has been treated in an O_2-inert gas mixture, optionally including steam at ≥ 400°C, to give NOx reduction at a predetermined temperature window.

Purification Catalyst for Lean Mixture Exhausts

KEMIRA OY. *World Appl.* 95/10,356A

A catalyst comprises a body with flow through conduits for exhaust gas, a high surface area support of an Al_2O_3 plus La oxide mixture on the surface of the body, with active catalytic Pt and Pd substances on the support. The catalyst purifies exhaust gases from lean mixture engines, particularly diesel engines, containing SO_2. Hydrocarbons and CO in the exhaust gases are converted to CO_2 and H_2O. Light-off temperatures are lower and the catalyst has a long life.

Pentafluoropropane Production

DAIKIN KOGYO K.K. *World Appl.* 95/13,256A

1,1,1,3,3-Pentafluoropropane (1) is prepared in high yield and selectivity by reducing 3-chloro-1,1,1,3,3-pentafluoropropane with H_2 in the vapour phase in the presence of 0.05–10 wt.% of Pd, Pt and/or Rh catalyst, supported on C, Al_2O_3, SiO_2 gel, TiO_2 and/or ZrO_2. The product is a substitute for CFCs and HCFCs for use as a coolant, foaming agent, etc.

Reduction of Nitric Oxide

W. R. GRACE & CO. *World Appl.* 95/15,208A

NO is reduced by organics in the presence of O_2 by passage over a catalyst comprising 0.2–10 wt.% of a Pt group metal catalyst, such as Rh and/or especially Pt, on a stable dealuminated Y zeolite, from which non-framework Al_2O_3 was removed. The zeolite framework has molar ratio SiO_2: Al_2O_3 > 10. The catalyst has improved NO reduction ability and more resistance to any reduction in activity caused by H_2O or SO_2.

Preparation of Hydroxylamine Derivatives

DSM N.V. *World Appl.* 95/16,667A

N-Alkyl-N,O-diacetyl hydroxylamine is prepared in a simple one-step reaction by catalytic reduction of the corresponding nitroalkane, preferably nitromethane, in the presence of acetic anhydride over Pt/Al_2O_3 catalyst. The reduction is carried out at 20–100°C and 1–9 MPa. The acylating agent, acetic anhydride, separates the products.

High Purity Benzene Production

CHEVRON RES. & TECHN. CO. *U.S. Patent* 5,401,365

Benzene is produced in high purity from olefin-containing aromatic feed by distillation to remove high boilers (1), followed by extractive distillation (2). Also claimed is a process for contacting a HC feedstream with a non-acidic Pt/L-type zeolite catalyst. The predistillation step (1) prevents detrimental dimerisation reactions in (2), thus removing the need for hydrogenation before or after (2), or clay after-treatment.

Tertiary Butyl Alcohol Preparation

TEXACO CHEM. INC. *U.S. Patent* 5,401,889

Tertiary butyl alcohol (1) is prepared from a charge stock solution containing 5–30 wt.% tertiary butyl hydroperoxide by continuous contact with a pelleted hydroperoxide decomposition catalyst $Pd\text{-}Au/Al_2O_3$ in liquid phase agitation, at 25–250°C, space velocity of 0.5–2 vol. of charge stock/vol. catalyst/h and 0–1,000 psig pressure. The process gives improved conversion rate and selectivity to (1).

Catalyst for Purification of Exhaust Gases

NISSAN MOTOR CO. LTD. *Japanese Appl.* 7/16,466

A purification catalyst is composed of 0.1–10 g/l Pt or Pd, 1–30 g/l K, Cs, Sr or Ba oxides, 1–50 g/l Co or Mn oxides, Ce oxide and activated Al_2O_3. HC, CO and NOx in exhaust gases are removed efficiently even under O_2-deficient and HC-rich atmospheres.

Purification Catalyst Production

MATSUDA K.K. *Japanese Appl.* 7/16,469

A metal containing silicate and aqueous Rh solution, such as Rh nitrate, is added to a Pt solution, such as a Pt amine, and to an Ir solution, such as $IrCl_3$, to form a slurry which is filtered to become the NOx purification catalyst. A metal containing silicate, supporting highly dispersed Pt, Ir and Rh, is obtained.

Preparation of High Purity Terephthalic Acid

MITSUBISHI KASEI CORP. *Japanese Appl.* 7/17,903

The preparation of high purity terephthalic acid (1) comprises dissolving crude (1), made by a liquid phase oxidation of *p*-xylene in H_2O at 220–320°C, and then contacting with a Pt group metal catalyst, such as Pd/C. This is followed by cooling to crystallise a first crop of (1), and separation from the mother liquor, with further cooling to recover a second crop. The recovery yield is improved by the second crop. About 90–99.5% of (1) is crystallised in high purity.

Diesel Engine Exhaust Purification Catalyst

ICT K.K. *Japanese Appl.* 7/24,260

A catalyst consists of a three dimensional structure coated with a catalyst composite of Pt and/or Pd loaded inorganic oxide powder (1) and another inorganic oxide powder (2). Powder (2) forms 0.25–25 g/l of the structure. Powder (1) is loaded with 5–50 wt.% Pt and/or Pd, and a metal oxide selected from W, Sb, Mo, Ni, B, Mn, Fe, Bi, Co, Zn or alkaline earth metal. The catalyst is used to remove C and S-containing particulates from diesel engine exhaust. The formation of sulphate is suppressed.

Exhaust Gas Purification Catalyst

NE. CHEMCAT K.K. *Japanese Appl.* 7/31,884

Ir and an alkaline earth metal, such as Ca, Sr and Ba, are supported by metal carbide, such as SiC, or a metal nitride, which is moulded or coated on a refractory substrate, and contacted with an exhaust gas containing HC, NOx and excess O_2 to reduce HC and purify it. NOx is removed efficiently in the presence of O_2 and under a high space velocity using the catalyst.

Hydrosilylation Catalyst

DOW CORNING TORAY SILICONE *Japanese Appl.* 7/41,678

A hydrosilylation catalyst with average particle size 0.1–10 μm comprises a Pt catalyst, containing 0.01–5 wt.% Pt metal, and a polycarbonate resin with a glass transition point of 50–200°C. The catalyst is useful as a curing catalyst for organopolysiloxane compositions. It does not show catalytic activity at ordinary temperature, so this composition has good storage stability, and the composition is easily cured by heating, even after a long period of storage.

Removal of Organic Chlorine Compounds

SUMITOMO METAL MINING CO. *Japanese Appl.* 7/47,270

A catalyst carrier, for removing organic chlorine compounds in air, is prepared by dropping an alkali solution into an aqueous solution of 10–20 wt.% of a Zr mineral acid salt to react them, ageing to give Zr hydrate and calcining at 500–600°C. The carrier is impregnated with Pt containing solution to give 0.3–5 wt.% of Pt, followed by further calcining.

Metal Support for Catalysts

TANAKA KIKINZOKU KOGYO K.K. *Japanese Appl.* 7/80,327

A metal support for a catalyst used for high temperature gas purification, such as in gas turbine engines, has a coating of Pt, Pd or Pt-Pd alloy film. The support has good resistance to heating and oxidation at > 1000°C. In an example, plates of stainless steel and Pt were immersed in an electrolytic cell of aqueous chloroplatinate solution to form a Pt layer on the steel. A porous Al_2O_3 layer and a further Pt layer were added.

Hydrocarbon Absorbing Catalyst

NISSAN MOTOR CO. LTD. *Japanese Appl.* 7/124,468

Hydrocarbon absorbent comprises a monolithic carrier, coated with an aqueous slurry containing zeolite, such as mordenite, USY, β-zeolite, etc., and further coated with active CeO_2 and/or Al_2O_3 slurry containing at least one of Pt, Pd and Rh. The zeolite has micropores to assist diffusion of gas to the absorption sites. 51.7% HC was absorbed in 125 s of cold start.

Reactor for Removing Carbon Monoxide

DAIMLER-BENZ A.G. *German Appl.* 4,334,981

A reactor for catalytic removal of CO in H_2-rich gas is coated with a selective CO-oxidation catalyst containing Pt group metal catalysts, such as Pt/Al_2O_3, Ru/Al_2O_3 or Pt/zeolite. The structure of the reactor creates turbulent flow and heat transport. The reactor can be used in conjunction with a fuel cell and prevents steep temperature gradients.

Exhaust Gas Purification Catalyst

MAZDA MOTOR CORP. *German Appl.* 4,435,074

A catalyst component for exhaust gas purification comprises a mixture of a metallosilicate having at least one active Pt group metal, such as tetra valent Pt and Ir, mixed with Al_2O_3 and/or CeO_2. Also claimed is the production of a honeycomb catalyst comprising the component, which is wash-coated or aged, or vice versa. The addition of Al_2O_3 and/or CeO_2, and the use of Pt and/or Ir in the +4 oxidation state shifts the peak temperature of NOx reduction to higher values.

A Palladium Catalyst

AS. SIBE. CATALYSIS INST. *Russian Patent* 1,420,714

A catalyst for the production of dimethylvinylcarbinol is prepared by dissolving Pd chloride in a boiling Na molybdate solution in molar ratio Mo:Pd of 1–1.5:1, before reducing with H_2 to form Pd metal, and mixing with an inorganic carrier. The catalyst gives improved activity and productivity without significant reduction in selectivity.

A Noble Metal Catalyst

KUNMING INST. NOBLE METALS CHINESE NON. *Chinese Appl.* 1,087,031

A Pt group metal catalyst for purifying waste gas from I.C.E. contains one of Pt, Pd, Rh or Ru (0.06–0.3 wt.%) as the active component. The carrier is in the form of a ball or honeycomb made of China clay and industrial Al oxide. A quick dipping method is used to add the active component to the carrier. The catalyst gives high purification and a long service life.

HOMOGENEOUS CATALYSIS

Preparation of *N*-Vinyl Compounds

BASF A.G. *European Appl.* 646,571A

The preparation of an *N*-vinyl compound from NH compounds uses acetylene at 50–250°C and 1–30 bar in the presence of a Pt group metal compound catalyst, such as $PdCl_2$, $OsCl_3$, $Ru(acac)_3$, $RuCl_3$, etc. The process gives an improved space-time yield and better control of the conversion of the acetylene. The *N*-vinyl compounds can be used as monomers, giving polymers for clarifying liquids, detergents, etc.

Hydroxy-Carbonylation of Butadiene

RHONE POULENC CHIM. *European Appl.* 648,731A

The hydroxy-carbonylation of butadiene and/or derivatives was produced by reaction with CO and H_2O in the presence of a Pd catalyst, such as $PdCl_2$, Pd acetate, etc., which is soluble in the reaction medium. The reaction is performed in the presence of crotyl chloride (≥ 2 mole/mole of Pd) as the promoter.

Production of Higher Vinyl Esters

UNION CARBIDE CHEM. & PLAST. TECHNOL. *European Appl.* 648,734A

Homogeneous liquid phase vinyl carboxylates are produced by reacting ethylene and carboxylic acid, preferably butyric, crotonic, benzoic, etc., using a Pd(II) catalyst formed in situ, Cu oxidant and Li promoter. Higher yields, ~ 69%, of vinyl esters are obtained.

Low Temperature Carbonylation

IMPERIAL CHEM. IND. P.L.C. *World Appl.* 95/15,938A

Low temperature carbonylation of acetylenically unsaturated compounds with CO in the presence of an allenically unsaturated compound, uses a catalyst system formed from a Pd compound, such as Pd acetate, etc., a protonic acid and an organic phosphine. The catalyst tolerates allenically unsaturated compounds and carbonylates them, e.g. butyne, pentyne, cyclohexylethyne from feedstocks obtained from cracking oil fractions.

Stereoselective Synthesis of Carbohydrates

SCRIPPS RES. INST. *World Appl.* 95/16,049

Carbohydrate is prepared by stereoselectively converting an alkene to an aldol intermediate by an Os-catalysed asymmetric dihydroxylation reaction, then stereoselectively elongating the aldol intermediate with a nucleophilic donor using an aldolase-catalysed aldol addition reaction. A rapid synthesis of ketose sugars is achieved by a minimal numbers of steps.

Method for Producing Allylic Alcohols

UNIV. IOWA STATE RES. FOUND. INC. *U.S. Patent* 5,401,888

Preparation of allylic alcohols in good yields comprises a Pd catalysed cross-coupling of vinylic epoxides and aryl halide, vinylic halide or vinylic triflates. Pd (II) catalysts, such as $PdCl_2$, $Pd(OAc)_2$, $PdBr_2$, $Pd(CN)_2$, etc., are used. The Pd(0) catalyst is $Pd(dba)_2$ or $Pd(PPh_3)_4$. The organic base is a 6–20C trialkylamine or dicycloalkyl(alkyl)amine. The reaction is performed at 60–120°C for 5–50h.

Hydrodehalogenation of Halogenated Benzenes

BAYER A.G. *German Appl.* 4,334,792

Hydrodehalogenation of halogenated benzenes comprises reacting with H_2 at 100–250°C in the presence of a catalyst prepared by depositing Pd and/or Pt salts, and optionally Cu salts, on an Al_2O_3 or TiO_2 support. The process produces useful lower halo-benzenes, such as *o*-dichlorobenzene, monochlorobenzene and/or benzene, from higher chlorobenzenes and *p*-dichlorobenzene. Good yields and selectivity, without forming cyclohexane derivatives, are achieved.

FUEL CELLS

Fuel Battery Electric System

NGK INSULATORS LTD. *Japanese Appl.* 7/57,758

A fuel battery power generation system incorporates a gas isolated membrane made up of Pd alloy, containing dissolved H_2 gas, which covers the support body. The fuel gas is refined using the H_2 gas isolator.The support body carries a negative electrode. The system increases the density of the fuel gas. It has improved electric power efficiency and removes CO_2 which poisons the electrode.

CHEMICAL TECHNOLOGY

Hexahydroxoplatinic Acid Preparation

TANAKA KIKINZOKU KOGYO K.K. *Japanese Appl.* 7/97,221

Preparation of $H_2Pt(OH)_6$ comprises neutralising Na hexahydroxoplatinate by ion exchange through contact with an inorganic acid via a cation exchange membrane.The $H_2Pt(OH)_6$ obtained can be used as a raw material for catalysts and as an intermediate for Pt compounds. The waste liquor contains no organic compounds, and can be treated easily at low costs.

ELECTRICAL AND ELECTRONIC ENGINEERING

A Hard Disc Recording Medium

HEWLETT-PACKARD CO. *European Appl.* 651,380A

A hard disc with textured surface having reduced static and dynamic friction is formed by applying a Ni-Pt layer on a metal substrate, than polishing to surface roughness of < 2 nm RMS, then sputtering on a metal layer having RMS surface roughness 1.0–8.0 nm. Low flying height between the recording head and the spinning recording media is obtained.

Structure for Mounting Electronic Parts

KYOCERA CORP. *Japanese Appl.* 7/40,569

Electronic parts are mounted on a ceramic baseplate by soldering the electrodes of the electronic parts onto the wiring layer on the ceramic baseplate. The wiring layer comprises a lower layer of Pd and an upper layer of Ni or Cu. The Pd metallic layer is laminated. The connection is reliable against thermal changes and parts can be mounted to a high density.

Overwritable Recording Medium

TOSOH CORP. *Japanese Appl.* 7/44,915

A photomagnetic recording medium for high density recording or overwriting comprises a substrate, recording film of artificial lattice film made of laminations of a layer comprised of at least one element selected from Fe, Co or Ni and a layer based on Pt and/or Pd, and at least one layer of a rare earth transition metal alloy layer (1). The artificial lattice film is reverse sputtered, and (1) is formed on it.

Multilayer Interconnection Board

IBIDEN CO. LTD. *Japanese Appl.* 7/106,758

An additive process for manufacturing multilayer interconnection board maintains the density of Pd ions in the liquid that is used during the Pd catalyst nucleus activation process at ≤ 1.2 ppm. An insulated adhesive layer is formed on a substrate; followed by a conductive layer, and then through hole formation.

Bump Electrode Formation Method

TANAKA DENSHI KOGYO K.K. *Japanese Appl.* 7/122,563

The method uses Pd wire, ≥ 99.9% pure, which is elongated by 2–6%. The wire is shaped as a thin line and is inserted into a capillary tube. A ball is produced under Ar, and adheres to the top surface of an Al wiring of a semiconductor chip. If the capillary is removed, the wire gets disconnected at a predetermined location, and a bump electrode is formed.

MEDICAL USES

Dental Alloy

JENERIC/PENTRON INC. *U.S. Patent* 5,423,680

The dental alloy, free of Pd, Ga and Cu, comprises (by wt. %): (a) 40–80 Au; (b) 5–50 thermal-expansion adjuster, selected from Pt, Ag, Nb and Ta; (c) 2–10 strengthener and oxide-former; (d) ≤ 1.5 grain refiner selected from Ir, Ru, Rh, Re and Co; and (e) 0.25 deoxidiser. The alloy is compatible with high-TCE dental porcelains and composites.

Yellow Dental Alloy

HERAEUS KULZER G.m.b.H. *German Appl.* 4,429,728

A yellow dental alloy contains mainly Au plus Pt group metals and base metals, and has the following composition (in wt.%): 80–95 Au, 5–20 Pt, 0.01–0.3 Rh, 0–0.1 Ir, 0.5–2.5 Zn and 0.01–0.5 Mn. The alloy is used to manufacture multi-section bridgework.

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