

(Ph₃P)₂ can be isolated by carefully controlling the reaction conditions. Electrophilic attack on the Rh by the carbonyl C is thus possible.

XXIX. Decarbonylation of Acid Halides and Carbonylation of Alkyl Halides Catalysed by Rhodium Complex

Ibid., *Tetrahedron Letters*, 1966, (39), 4713-4716
(PPh₃)₂RhCOCl efficiently catalyses the homogeneous decarbonylation of acyl and aroyl halides to olefins and aryl halides respectively, and the carbonylation of some alkyl halides, e.g. benzyl chloride to phenylacetyl chloride in C₆H₆ at 150°C, 100 atm p_{CO}.

CATHODIC PROTECTION

Corrosion Protection of Drying Cylinders in Paper-making Machines by Cathodic Polarisation

A. ALMAR-NAESS, *Corrosion Sci.*, 1966, 6, (5), 205-225

Electrochemical theory and practical details of the method of protecting cast iron drying cylinders using a Pt anode. (See *Platinum Metals Rev.*, 1966, 10, (2), 48-51).

CHEMICAL TECHNOLOGY

Selective Reductions with Electrolytically Produced Hydrogen

J. B. LEE and P. CASHMORE, *Chem. & Ind.*, 1966, (42), 1758-1759

An electrolytic cell containing 5% H₂SO₄, an anode of Pt gauze and a cathode of Ag-Pd alloy tube produced H₂ which reduced acetylenes to the corresponding olefins, and acetylenic alcohols and acids to the olefinic compounds. No *trans* olefins were produced. Neither were other types of compounds reduced.

NEW PATENTS

METALS AND ALLOYS

Palladium Alloy Tubes

J. BISHOP & CO. *U.S. Patent* 3,254,956

An improved process for the production of ultra-pure H₂ utilises a reaction tube made of porous ceramic impregnated with Fe, Ni or Pt and lined with a thin-walled Pd-alloy tube, preferably made of Pd-Ag alloy.

Nuclear Fuel Element

ATOMIC ENERGY COMMISSION

U.S. Patent 3,261,757

A nuclear fuel element for use in a chemonuclear

TEMPERATURE MEASUREMENT

Fifty Years of Temperature Measurement

J. A. HALL, *J. Sci. Instrum.*, 1966, 43, (8), 541-547

A survey of developments in thermometry since 1916 discusses the accuracy and reproducibility of the temperature scale itself and then the accuracy with which practical measurements may be made in terms of that scale. Pt metal thermocouples and the Pt resistance thermometer have become increasingly important and more accurate.

Silver-Palladium as an Indicator of Thermal Gradients in Pellet Induration

H. W. HITZROT, L. V. FEGAN and R. A. LIMONS, *Trans. Soc. Mining Eng. A.I.M.E.*, 1965, 232, (2), 95-99

Ag-Pd wires with specific melting points from 2000 to 2500°F indicate pellet-bed temperatures in travelling-gate or shaft furnaces. Wires are encased in ceramic capsules which accompany a sample of green pellets in a Nichrome wire basket during firing. After exposure, each capsule is recovered from the basket and examined to find the maximum temperature attained. Disadvantage of the method is that it is not continuous but it is cheaper than thermocouples.

The Total Hemispherical Emittance of Coated Wires

D. BRADLEY and A. G. ENTWISTLE, *Br. J. Appl. Phys.*, 1966, 17, (9), 1155-1164

A theory for the derivation of hemispherical spectral emittance and hence total hemispherical emittance, for a uniformly coated cylinder is applied to fine 10% Rh-Pt wires coated in fused SiO₂ at 340-1350°C and agrees with experiment. Effect of coating thickness is discussed.

reactor comprises an inner core composed of an alloy of 50-98 wt.% Pd, 1-30 wt.% U and 1-20 wt.% Pt and a 0.2-6μ external coating of Pt.

ELECTROCHEMISTRY

Electrolytic Technique for Hydrogen Recovery

AMERICAN CYANAMID CO. *British Patent* 1,039,411

An electrolytic process for separating and recovering H₂ from a gaseous mixture, where the gas-permeable anode is made of, or contains a Pt group metal, preferably Pt, Pd or Rh. See also 1,039,412.

Electrodes for Electrolytic Cells

DAVID J. EVANS (RESEARCH) LTD.
British Patent 1,045,816

A bipolar electrode for an electrolytic cell comprises two sheets of Pt, Rh, Ru, Ti or Ni coated with Pt which are separated by a plate of electrically insulating material extending beyond the edges of the metal sheets. The metal sheets are connected together through the insulating plate.

Platinum-coated Electrodes

J. BISHOP & CO. *U.S. Patent 3,254,015*

The over-voltage of a Pt-coated anode for a Cl_2 cell is lowered by first charging the Pt with H_2 by electrolysis it cathodically in a solution which is free of Pt until evolution of H_2 occurs on its surface and then heating the anode at $700\text{--}1,000^\circ\text{F}$ so that there is at least some recrystallisation of Pt.

Platinum Group Metal Electrodes for a Radiation Cell

UNION CARBIDE CORP. *U.S. Patents 3,255,044-5*

A redox couple radiation cell has a carbon porous cathode and a Pt metal anode, preferably Pt coated with a finely divided Pt black. See also 3,255,046.

ELECTRODEPOSITION AND SURFACE COATINGS

Electrodeposition of Palladium

INTERNATIONAL BUSINESS MACHINES CORP.
British Patent 1,040,410

An electrolyte for the electrolytic deposition of Pd at pH 4-5, $23\text{--}65^\circ\text{C}$ and $3.6\text{--}4.6\text{ A/ft}^2$ comprises an aqueous solution containing $0.01\text{--}0.121$ moles/l Pd and, for each mole of the latter, about 2 moles complexing agent and a suitable buffer.

Production of Metallic Coatings on the Surfaces of Other Metals

INTERNATIONAL BUSINESS MACHINES CORP.
British Patent 1,042,816

Non-metallic surfaces are provided with conducting or magnetic coatings by pretreatment with a seeding metal compound, preferably a Pd compound, followed by electroless plating.

Palladium Electroplating Bath

JOHNSON MATTHEY & CO. LIMITED
French Patent 1,436,451

The electrolyte is an alkaline or neutral aqueous solution of a Pd compound and an NH_4 salt of a weak acid which does not form an insoluble product with the Pd compound.

Platinum Plating of Molybdenum

VEB BERLINER GLUHLAMPEN-WERK
German Patent 1,221,518

Mo wire in particular is chemically plated as it passes through a bath, at $125\text{--}250\text{ m/h}$, containing $350\text{--}500\text{ g/l H}_2\text{PtCl}_6$ and $20\text{--}30\text{ g/l HgCl}_2$ and

then is treated at $1,000^\circ\text{C}$ in moist H_2 before the coating is intensified by electrolytic plating and the moist H_2 treatment is repeated.

LABORATORY APPARATUS AND TECHNIQUES

Weights for Balance Accuracy

SARTORIUS-WERKE A.G. *German Patent 1,223,169*

The accuracy of balance weighing with two arms is increased by exclusion of the air buoyancy effect by pairing weights of identical volume but different density on both arms. Suitable materials are pure Ir and a 64% Rh-36% Ni alloy.

BRAZING

Brazing Alloys

WESTINGHOUSE BRAKE AND SIGNAL CO. LTD.
British Patent 1,044,379

A brazing alloy useful in the manufacture of semiconductor comprises 4-10 wt.% In, Sn or Ga, 20-40 wt.% Cu, 5-20 wt.% Pd and balance Ag.

CATALYSTS

Hydrogenation of Salts of Phthalic Acids

BADISCHE ANILIN- & SODA-FABRIK A.G.
British Patent 1,037,693

Salts of phthalic acids are hydrogenated to the corresponding salts of the hexahydrophthalic acids at $120\text{--}350^\circ\text{C}$, 50-350 atm, in the presence of Pt, Pd, Ru and/or Rh catalyst and in the presence of a salt of the isomer of hexahydrophthalic acid which is not desired.

Manufacture of 1,4-Benzodioxanylalkylamino-ethanols

IMPERIAL CHEMICAL INDUSTRIES LTD.
British Patent 1,038,335

1,4-Benzodioxan derivatives are produced by reducing 1,4-benzodioxan-2-ylglyoxal or its hydrate by catalytic hydrogenation in the presence of Pt catalyst, an amine or its acid-addition salt and an inert diluent.

Hydrogenation of Quinoline

ALLIED CHEMICAL CORP.
British Patent 1,038,644

5,6,7,8-Tetrahydroquinoline is produced by contacting quinoline and/or 1,2,3,4-tetrahydroquinoline with H_2 at above 300°C and in the presence of a Pt or Pd catalyst.

Organopolysiloxane Process

GENERAL ELECTRIC CO. *British Patent 1,038,876*

The molecular weight of a mixture of at least two organopolysiloxanes, one of which has Si-H bonds and the other Si bonded vinyl and/or allyl

radicals, is increased by contacting it with a complex (PtCl₂.olefine)₂ or H(PtCl₃.olefine).

Improved Hydrocracking Conversion Catalyst and Process

ESSO RESEARCH & ENGINEERING CO.
British Patent 1,039,167

An improved catalyst for the hydrocracking of hydrocarbons at 500–800°F and 300–5,000 psig which comprises 0.05–5 wt.% Pt group hydrogenation component composited with crystalline synthetic mordenite zeolite.

Production of Isoprene

INSTITUT FRANCAIS DU PETROLE, DES CARBURANTS ET LUBRIFIANTS
British Patent 1,039,255

In the production of isoprene the crude 4,4-dimethyl-1,3-dioxan is treated with H₂ at up to 200°C and in the presence of Ni, Rh, Pt or Pd as hydrogenation catalyst.

Production of Hydroxylamine

INVENTA A.G.
British Patent 1,039,866
Hydroxylamine is produced by the reduction of NO by H₂ in acid solution, at 65–80°C and in the presence of the hydroxylamine salt of the acid and a Pt group metal deposited on activated C and impregnated with AgNO₃.

Autofining of Petroleum Hydrocarbons

THE BRITISH PETROLEUM CO. LTD.
British Patent 1,040,298
White spirits are produced by contacting at 550–820°F and 100–600 psig, a S-containing straight run petroleum naphtha of 30–200°C boiling range with a refractory metal oxide supporting 0.01–5 wt.% Pt group metal.

Process for the Production of Hydroxylamine Sulphate Solution

INVENTA A.G.
British Patent 1,040,500
An hydroxylamine sulphate solution is produced by the continuous reduction of NO with H₂, at 30–85°C in an aqueous H₂SO₄ solution and in the presence of a Pt group metal catalyst.

Production of Hydrogen Peroxide

IMPERIAL CHEMICAL INDUSTRIES LTD.
British Patent 1,041,045
H₂ and O₂ are reacted in the presence of a solid Group IB or VIII catalyst, e.g. an Au-Pd mixture, in the presence of liquid H₂O, an acid and a non-acidic organic compound containing O₂.

Oxidation of Hydrocarbons and Alcohols

IMPERIAL CHEMICAL INDUSTRIES LTD.
British Patent 1,041,046
Aldehydes or ketones are produced by oxidation in contact with a crude H₂O₂ solution in H₂O, acid and a solid Group IB or VIII metal catalyst, e.g. palladised SiO₂.

Production of Glyoxal

BADISCHE ANILIN- & SODA-FABRIK A.G.
British Patent 1,041,376
Ethylene is reacted with HNO₃ in aqueous medium in the presence of a Pd salt catalyst in an amount of more than 0.0001 wt.% of the reaction mixture. Preferably the salt is PdCl₂ or Pd(NO₃)₂.

Regenerating Lead-Contaminated Catalytic Composite

UNIVERSAL OIL PRODUCTS
British Patent 1,041,751
A catalyst containing a Group IB, VA, VIA or VIII metal deposited on a refractory oxide support is regenerated by treatment with an aqueous synthetic detergent solution and drying. The catalyst especially consists of 0.01–10 wt.% of Pd, Ru, Rh, Ir or Os on an oxide support.

Diamides

IMPERIAL CHEMICAL INDUSTRIES LTD.
British Patent 1,042,482
In the production of dipeptide derivatives, hydrogenolysis of the corresponding N-benzyloxy-carbonyl-L-aspartyl-L-phenylalanine-amides is carried out over Pd/C. See also 1,042,485–6.

New Fused Polycyclic Hydrocarbon Derivatives

ROUSSEL-UCLAF
British Patent 1,042,631
Hydroindane compounds useful in steroid synthesis are obtained by a process involving catalytic hydrogenation over a Pd catalyst which does not cause isomerisation. See also 1,042,632–3.

Preparation of Cyclic Polyolefinic Hydrocarbons

E. I. DU PONT DE NEMOURS & CO.
British Patent 1,043,800
8-16C non-conjugated polyolefinic hydrocarbons are hydrogenated selectively, to the corresponding cyclic mono-olefines by reacting them at 25–150°C and 1–100 atm with H₂ in the presence of 0.1–5 wt.% Pd or Pt catalyst and 50–150 wt.% H₂O based on the weight of hydrocarbon.

Improved Hydrocracking Process

ESSO RESEARCH & ENGINEERING CO.
British Patent 1,045,397
Hydrocarbon fractions boiling above 300°F are hydrocracked by contacting them at 500–800°F with H₂ and a catalyst comprising a Pt group metal supported by a 6–15 Å pore size zeolite which has been base exchanged to reduce its Na₂O content below 10% and maintaining initially a high concentration of catalyst poison and reducing it as the process proceeds.

Preparation of Chlorine, Bromine and Iodine

SHELL INTERNATIONALE RESEARCH MIJ. N.V.
British Patent 1,046,313
Cl₂, Br₂ and/or I₂ are prepared by contacting a

mixture of hydrogen halide and O₂ with a catalyst comprising 0.1–15% Ru or a compound thereof on a suitable carrier, at 250–500°C and 0.1–100 atm.

Rhodium Oxide Hydrogenation Catalyst

ESSO RESEARCH AND ENGINEERING CO.

U.S. Patent 3,253,018

Aldehydic esters are prepared by reacting dienes with CO and coreactant containing H bonded to a non-carbon atom in the presence of Rh₂O₃.

Platinum Group Metal Catalysts in the Production of Esters

UNION OIL CO. OF CALIFORNIA

U.S. Patent 3,253,020

An unsaturated ester is produced by reacting a hydrocarbon olefine with a medium consisting of the carboxylic acid, less than 10 wt.% water, 0.001–5 wt.% Pt group metal and 0.05–2 wt.% soluble bromide.

Platinum Group Metal Isomerisation and Hydrocracking Catalysts

THE BRITISH PETROLEUM CO. LTD.

U.S. Patent 3,253,055

Paraffinic hydrocarbons are subjected to hydro-catalytic conversion by contacting them with H₂ at 205–400°C and 100–500 psi and in the presence of Al₂O₃ which has been contacted with a halogen-generating compound and supports 0.01–5 wt.% Pt group metal.

Platinum Group Metal Catalysts for the Conversion of Exhaust Gases

UNIVERSAL OIL PRODUCTS CO.

U.S. Patent 3,254,966

A catalytic element for the oxidation of combustion engine exhaust gases comprises a housing with perforated walls within which are disposed small perforated containers. The housing is filled with crimped metal ribbons coated with a Pt group metal and the containers are filled with a Pt group metal or alloy supported on a refractory metal oxide material.

Platinum Group Metal Hydrogenation Catalysts

AIR PRODUCTS AND CHEMICAL INC.

U.S. Patent 3,255,200

Imidazole is produced by contacting a mixture of H₂, formamide and ethylenediamine at 340–480°C with a catalyst comprising a sorptive refractory oxide and 0.1–2 wt.% Pt group metal, preferably Pt or Pd.

Platinum Group Metal Hydrogenation Catalysts

SHIONOGI & CO. LTD.

U.S. Patent 3,256,286

The hydrogenation of morphinon derivatives is carried out in the presence of supported or unsupported Pt, Pd or Ni catalysts.

Noble Metal Catalysts for the Treatment of Automobile Exhaust Gases

E. I. DU PONT DE NEMOURS & CO.

U.S. Patent 3,257,163

The exhaust gases formed by the combustion of leaded petrol are purified by contacting them with a scavenger, e.g. alkali or alkaline earth metal vanadates, Al, Co, etc., and a Pt, Rh, Pd or Ru catalyst.

Palladium Decarbonylation Catalyst

THE QUAKER OATS CO. *U.S. Patent 3,257,417*

Furfural is decarbonylated in the liquid phase to furan by contacting it at 190–225°C with more than 0.01 mole Ca acetate in the presence of a Pd catalyst.

Platinum Group Metal Reforming Catalysts

SINCLAIR RESEARCH INC. *U.S. Patent 3,258,420*

A hydrocarbon feedstock of 90–450°F boiling range is reformed by passing it and H₂ over a fixed bed of refractory metal oxide particles supporting 0.3–1 wt.% Pt group metal, preferably Pt, at 900–980°F and 150–250 psig.

Platinum-Fluorine-Alumina Reforming Catalyst

PHILLIPS PETROLEUM CO. *U.S. Patent 3,258,503*

Pt-F₂-Al₂O₃ catalyst is preferred in the production of C₆H₆ from 6–9 C cycloparaffins.

Waste Gas Combustion Treatment

UNIVERSAL OIL PRODUCTS CO.

U.S. Patent 3,259,454

The effectiveness of a Pt/Al₂O₃ catalyst in burning waste gases is improved by adding a tertiary dicarboxylic acid to the gas.

Isomerisation Process

PHILLIPS PETROLEUM CO. *U.S. Patent 3,260,762*

The isomerisation of cyclohexane to methyl cyclopentane is catalysed by a Pt metal supported on an oxide or oxides.

Diene Production

PETRO-TEX CHEMICAL CORP.

U.S. Patent 3,260,767

Aliphatic dienes are produced from hydrocarbons by dehydrogenation over a supported PdO catalyst.

Alumina Supported Palladium Catalyst

L'AIR LIQUIDE, S.A. *French Patent 1,428,528*

Oxygenated H₂O is produced by a cyclic process involving partial oxidation of anthraquinone in the presence of 2% Pd/Al₂O₃ catalyst.

Platinum Hydrogenation Catalyst

INVENTA A.G.

French Patent 1,429,133

Nitrogen oxide is hydrogenated in an acid medium and in the presence of 2% Pt/C catalyst, which is periodically reactivated by contact with HF.

Trimeric Ruthenium Tetracarbonyl

LONZA S.A. *French Patent 1,430,131*

Hydroquinone is produced by reacting C_2H_2 and CO at 100–300°C and 150–350 atm in the presence of organic solvent, H_2 and trimeric $Ru(CO)_3$ catalyst.

Platinum Group Metal Hydrocarbon Conversion Catalysts

THE BRITISH PETROLEUM CO. LTD.

French Patent 1,431,985

A hydrocarbon conversion catalyst comprises crystalline mordenite of at least 5 Å pore size and 0.01–10 wt.% Group VI or VIII metal, including the Pt group metals.

Alumina-supported Noble Metal Catalysts

METALLGESELLSCHAFT A.G.

French Patent 1,432,084

The gas formed during the course of the manufacture of electrodes for the electrolytic production of Al is purified by contacting it with an O_2 containing gas and Al_2O_3 supporting a noble metal, preferably Pt or Pd.

Noble Metal Oxide Polymerisation Catalysts

THE GOODYEAR TIRE & RUBBER CO.

French Patent 1,433,069

Amongst the catalysts which are used in the polymerisation of vinyl alkyl ethers are the reaction products of concentrated H_2SO_4 and Ru, Rh, Pd, Os, Ir or Pt oxides.

Selective Acyl Dione Hydrogenation

UNION CARBIDE CORP. *French Patent 1,434,085*

The hydrogenation of the 2-acyl group of 2-acylcyclopentane-1,3-diones to an 2-alkyl group is accomplished using finely divided Pt, Pd, Rh or Ir.

Platinum Group Metal Isomerisation Catalysts

THE PURE OIL CO.

French Patent 1,437,357

n-Pentane and/or n-hexane are isomerised without any hydrocracking by treating them with H_2 at 371–380°C, 7–8.7 kg/cm² pressure and in the presence of a catalyst comprising 0.1–1 wt.% Pt group metal, preferably Pd or Rh, up to 5 wt.% combined F_2 , and a SiO_2/Al_2O_3 support containing 50–95 wt.% SiO_2 .

Hydroxylamine Sulphate Production

INVENTA A.G.

German Patent 1,219,453

NO is reduced with H_2 in the presence of Pt catalyst (e.g. Pt/C) and H_2SO_4 .

Beta-pinene Production

FARBWERKE HOECHST A.G.

German Patent 1,221,218

The isomerisation of α -pinene at 140–200°C in

the gas phase in the presence of 1–5 vol.% H_2 is catalysed by 0.5–10 wt.% Pd/C.

Carboxylic Ester Production

BADISCHE ANILIN- & SODA-FABRIK A.G.

German Patent 1,221,224

The reaction of at least 3C olefines with CO and alcohols or phenols is catalysed by L_mPdX_n where L is phosphine, NH_3 , amine, RCN or unsaturated hydrocarbon, X is anion, and m and n are 1 or 2, e.g. $(PPh_3)_2PdCl_2$.

Vinyl Compound Production

FARBWERKE HOECHST A.G.

German Patent 1,221,637

The reaction of C_2H_4 , O_2 and nucleophilic compounds is catalysed by PdO, preferably on a support.

Production of Allyl Chloride

FARBWERKE HOECHST A.G.

German Patent 1,222,913

Olefines with 3–4C atoms are reacted with O_2 and HCl at 20–35°C using PdO as catalyst. French Patent 1,435,688 is almost identical but additionally covers the use of any Group VIII noble metals. See also 1,224,301.

FUEL CELLS

Catalytic Electrode for a Fuel Cell

AMERICAN CYANAMID CO.

British Patent 1,038,300

A fuel cell electrode comprises 1–75 wt.% finely divided Group III, IV or V metal oxide, a binder-waterproofing agent and a Pt group or other noble metal. After shaping, the electrode is leached to a 0.01–10 wt.% oxide content and optionally is additionally electroplated with a Pt group metal, preferably Pt.

Gaseous Fuel Cell

GENERAL ELECTRIC CO.

British Patent 1,038,884

A fuel cell for use with carbonaceous gases has an electrolyte in the form of an aqueous solution of Cs and/or Rb hydroxide, carbonate and/or bicarbonate positioned between and in direct electrical contact with a pair of gas-permeable conductive electrode elements containing a Pt group metal as the catalytic constituent.

Fuel Cell Electrode

AIR PRODUCTS AND CHEMICALS INC. and

NORTHERN NATURAL GAS CO.

British Patent 1,039,604

A fuel cell electrode is produced by impregnating a porous, electroconductive support material with compounds of Pt and Ag, Au, Ru, Os, Rh, Ir or Pd promoter metal taken in 1:2 to 2:1 molar ratio, drying the support, reducing the noble metal compounds to precipitate the metals and washing the impregnated electrode.

Fuel Cells

LEESONA CORP. *British Patent 1,040,343*

A fuel cell for the direct generation of electricity comprises a non-porous H₂ diffusion membrane made of an alloy of 5-40 wt.% Au and Pd, a cathode and an aqueous electrolyte.

Fuel Cell Electrode

AIR PRODUCTS AND CHEMICALS INC. and
NORTHERN NATURAL GAS CO.

British Patent 1,040,681

An electrode is manufactured by plating Pt on to a base from a salt solution using a Pt auxiliary electrode and a low frequency pulsating electric current.

Fuel Cells

SIEMENS-SCHUCKERTWERKE A.G.

British Patent 1,044,872

A fuel cell includes an O₂ electrode in the form of Pd, Pd-Ag alloy or Pt or conductive material coated with such metals and is formed as a membrane which is permeable to H₂ but not to other gases.

Fuel Cell Electrodes Containing Platinum Group Metals

AMERICAN CYANAMID CO. *U.S. Patent 3,252,839*

A fuel cell electrode comprises carbon, 0.1-40 wt.% Pt group metal and a waterproofing agent and an electrodeposited layer of 0.1-10 wt.% Pt group metal, preferably Pt.

Noble Metal Fuel Cell Electrodes

VARTA A.G. and SIEMENS-SCHUCKERTWERKE A.G.

U.S. Patent 3,253,956

An improved fuel cell includes electrodes consisting of activated C and 1-20 wt.% Pt, Pd and/or Ir.

Combined Fuel Cell Electrolyte and Noble Metal Electrodes

INSTITUTE OF GAS TECHNOLOGY

U.S. Patent 3,257,239

A fuel cell is made by mixing finely powdered carbonates of at least one alkali or alkaline earth metal with finely powdered refractory material, pressing the mixture into a flat plate, coating one face with a suspension of finely divided Group IB metal, e.g. Ag, and the other with a Pt group metal, evaporating the suspension medium and finally sintering the plate to form thin coatings of noble metals on its faces.

Porous Fuel Cell Electrodes

ESSO RESEARCH & ENGINEERING CO.

French Patent 1,430,123

A porous fuel cell electrode is produced by intimately mixing a binder, a charge which decomposes giving a gaseous product and a supported or unsupported Pt group metal or alloy, shaping the mass at elevated temperature and then heating

the shaped electrode to cause evolution of gas and pore formation.

Fuel Cell-Electrode

H. L. C. HYRAUD

French Patent 1,434,265

A new form of H electrode is thin and flexible, e.g. Pd or Pt deposited on a paper support.

GLASS TECHNOLOGY

Apparatus for Melting Glass

STE. DES VERRERIES INDUSTRIELLES

RENNIES DE LOING

British Patent 1,045,604

An apparatus for melting glass comprises a Pt or Pt alloy crucible which acts as one electrode, a heating inductor surrounding the crucible and forming part of the oscillatory circuit of a high frequency generator and another electrode which makes it possible to pass electric current directly through the vitreous materials in the crucible.

ELECTRICAL AND ELECTRONIC ENGINEERING

Fuse Member

SIGMUND COHN CORP.

British Patent 1,038,059

A fuse member comprises an intimate unalloyed mixture of (i) 20-95 wt. parts Pt, Pd, Rh, Ru, Ir and/or Au and (ii) 5-80 wt. parts Al and/or Mg.

Electrical Resistor

ELECTRA MANUFACTURING CO.

U.S. Patent 3,252,831

A film-type electrical resistor comprises an electrically insulating substrate resistant to high temperatures and a deposited metal-glass film containing Ag, Au and/or metal component, preferably 25-65 wt.% Ag, 20-45 wt.% Pt and 5-35 wt.% Au.

Composite Alloy Electric Contact Element

J. COHN *et al.*

U.S. Patent 3,254,279

An electrically conductive contact is composed of an alloy comprising 0.3-6 wt.% Ga, 0.1-20 wt.% Pt and/or 0.055-11 wt.% Pd and the balance Ag and/or Au.

Use of Noble Metals in the Manufacture of Semiconductors

CARMAN LABORATORIES INC.

U.S. Patent 3,261,075

In the manufacture of a semiconductor device comprising a siliconiferous crystal bounded by a circumferential edge and having at least one n-p junction terminating at said edge, a thin coating of Pt, Pd, Rh, Ir, Ru, Os, Au, Ag or their alloys is applied to the conductive leads, a thin bonding layer of Ag, Pt, Pd or their alloys is fused to the crystal face following which the leads are bonded to the crystal and the assembly is encased in glass.