

The Effect of Corrosion, Electrical and Mechanical Loading on the Behaviour of Contact Materials

E. BAIER, *Verbindungstechnik*, 1971, 3, (3), 17-18

The properties and applications of electrical contact materials made of a number of precious metals and alloys including Au, Ag and Pt group metals are reviewed.

Report on British Corrosion Group Meeting

British Corrosion J., 1971, 6, (5), 192-193

The use of Pt/Ti for impressed current anodes and their performance, wear and efficiency were discussed. Tests indicated that wear rates of Pt are $\sim 1-2 \mu\text{g}/\text{amp hour}$. Reduction in life-time is probably due to acidity. An anode with 100μ in Pt should last 3-6 years at $100 \text{ amp}/\text{ft}^2$.

TEMPERATURE MEASUREMENT

Platinum Resistance Thermometers for Precise Measurements up to 1100°C

W. HEYNE, *Exp. Tech. Phys.*, 1971, 19, (2), 143-150

Improvements of the IPTS at $630-1064^\circ\text{C}$ were sought using Pt resistance thermometers for interpolation in place of Pt:Rh-Pt thermocouples. Low-resistance thermometers were made for 60 mm immersion having a 10 mm diam. ceramic insulator, with double wound coils of Pt wire 0.25, 0.3 and 0.5 mm thick enclosed in quartz tubes. After 40h the resistance change from thermal effects is $\pm 0.008 \text{ deg C}/\text{h}$ at 1060°C and less than ± 0.001 at 0°C . The thermal resistance changes did not depend on wire diameter unlike impurity effects. Only 0.5 mm wire had suitable precision as regards the latter.

NEW PATENTS

METALS AND ALLOYS

Nitrogen-free Platinum

E. I. DU PONT DE NEMOURS & CO.

British Patent 1,254,033

The manufacture of Pt powders, for use in metallising compositions and the production of printed circuits, which are relatively coarse-grained and free from N_2 , is described. Pt is precipitated by Zn from an aqueous PtCl_4 solution, HCl is added until no further reaction is observed and the precipitate is filtered off, washed and dried.

Relative Pressure Dependence of Chromel/Alumel and Platinum/Platinum-10% Rhodium Thermocouples

D. LAZARUS, R. N. JEFFERY and J. D. WEISS, *Appl. Phys. Lett.*, 1971, 19, (10), 371-373

Measurement of the relative thermal e.m.f.s of Chromel:Alumel and Pt:10% Rh-Pt thermocouples up to 7 kbar indicate a pressure correction for Pt couples of $0.57 \pm 0.03 \text{ deg C}/\text{kbar}$ from $600-1000^\circ\text{C}$. Systematic differences of unknown origin are found between pressure corrections measured with increasing and decreasing pressure.

Control of a Steel Ingot Intermediate Heating Furnace

H. KLAMMER, *Instrum. Prac.*, 1972, 26, (1), 31-33

Pt:Rh-Pt thermocouples are used to sense temperature in a comprehensive instrumentation system which controls the furnace temperature automatically. The system is designed with a view to computer control in the future.

High Precision Thermometry Using Industrial Resistance Sensors

A. THULIN, *J. Phys. E: Sci. Instrum.*, 1971, 4, (10), 764-768

Stability tests on glass-embedded and glass-bonded Pt wire 100 ohm sensors show that reproducibility in temperature measurement of a few millidegrees can be obtained when working below 150°C if the sensors are thermally cycled over the intended range of measurement prior to calibration.

Thermocouples for above 1500°C

E. D. ZYSK and A. R. ROBERTSON, *Instrum. Technol.*, 1971, 18, (11), 30-38

The use of thermocouples made of Pt, Rh, Ir, W, Re and other refractory metals in a variety of combinations is described for high temperature applications.

CHEMICAL COMPOUNDS

Hydride and Carbonyl Triphenylphosphine Derivatives of Ruthenium and Osmium

AMERICAN CYANAMID CO.

U.S. Patent 3,597,461

Pentacoordinate complexes of Ru and Os have the general formula $\text{M}(\text{CO})_{5-n}[\text{P}(\text{C}_6\text{H}_5)_3]_n$, where M is Ru, Os and n is 1,2. They are prepared by reacting the corresponding pentacarbonyls with triphenylphosphine. Dihydride compounds of formula $\text{MH}_2(\text{CO})_2[\text{P}(\text{C}_6\text{H}_5)_3]_2$ (M=Ru, Os) are also described.

ELECTRODEPOSITION AND SURFACE COATINGS

Metal Plating of a Nonconductive Substrate

R.C.A. CORP. *British Patent 1,253,568*

A non-conductive substrate is coated with a film of rubber compounded with benzophenone and elemental. It is then exposed to actinic light in a desired pattern. The article is then sensitised and activated using PdCl_2 , but the unexposed areas contain free S which poisons the catalyst. This prevents the subsequent deposition of Ni.

Ruthenium Plating Bath

R. MULLER-BORNIER *German Offen. 2,114,119*

Ru is electroplated together with a second Pt metal (Rh, Pt or Pd) from a bath containing 0.5-50 g/l of Ru as the complex $(\text{NH}_4)_3(\text{Ru}_2\text{Cl}_8(\text{H}_2\text{O})_2\text{N})$ and 0.05-20 g/l of the other metal.

LABORATORY APPARATUS AND TECHNIQUE

Oxygen Analyser

BAILEY METER CO. *U.S. Patent 3,598,711*

An electrochemical cell has a ZrO_2 tubular electrolyte with porous Pt electrodes bonded to its inner and outer surfaces. A Pt lead from each electrode transmits the cell emf generated when the inner and outer surfaces of the electrolyte are in contact with gases having different O_2 contents.

JOINING

Alloy for Brazing Powder

INTERNATIONAL NICKEL CO. INC.
U.S. Patent 3,597,194

A brazing alloy contains Ni, Pd and Zr; the alloy can be crushed easily and shows good adhesion for brazing ceramics and metals.

HETEROGENEOUS CATALYSIS

Hydrogenation Catalyst

CONSOLIDATION COAL CO.
British Patent 1,251,336

Liquid fuel is obtained by extraction of coal with an organic solvent and hydrogenation of the extract in the presence of a Pt group metal oxide, preferably supported on Al_2O_3 .

Catalyst

UNIVERSAL OIL PRODUCTS CO.
British Patent 1,251,388

Toluene is converted to C_6H_6 and xylenes by heating it in the presence of H_2 and a crystalline aluminosilicate, one of As, Sb, Bi, Se, Te or their compounds and a Group VIII metal, preferably Pt or Pd.

Reforming Catalyst

CHEVRON RESEARCH CO. *British Patent 1,253,408*
A catalyst for reforming of naphtha consists of a porous solid carrier with 0.01-3 wt.% Pt, 0.01-3 wt.% Re and 0.001 to 0.1 wt.% Ir.

Catalyst

OLIN CORP. *British Patent 1,254,204*

Organic isocyanates are obtained by the reaction of nitro compounds with CO in the presence of a catalyst which includes one halide or oxide of a noble metal, including Ag and Au, but is preferably Pd, Rh, Pt or Ir.

Isomerisation Catalyst

SHELL INTERNATIONALE RESEARCH MIJ. N.V.
British Patent 1,255,459

Alkyl/aryl hydrocarbons are isomerised by heating with H_2 in the presence of an acidic ceramic oxide and Pd or Pt.

Hydrogenation Catalyst

BRITISH NUCLEAR DESIGN & CONSTRUCTION LTD.
British Patent 1,255,473

CH_4 for use in nuclear reactors is obtained by the reaction of CO_2 with pure H_2 on $\text{Ru}/\text{Al}_2\text{O}_3$.

Hydroformylation Catalyst

RUHRCHEMIE A.G. *British Patent 1,255,537*

Phenylpropanals and phenylpropanols are obtained by reacting styrene with CO and H_2 in the presence of Rh catalyst (e.g. Rh_2O_3).

Hydrocarbon Conversion Catalyst

UNIVERSAL OIL PRODUCTS CO.
British Patent 1,255,544

A hydrocarbon conversion catalyst consists of a carrier material containing Al_2O_3 and a finely divided crystalline aluminosilicate supporting 0.05-1.0 wt.% of a Pt-group metal and 0.05-1.0 wt.% of Re. See also *British Patent 1,256,000*.

Catalysts

OLIN CORP. *British Patent 1,257,932*

Organic isocyanates are obtained by reaction of nitro compounds in the gas phase with CO in the presence of noble metal catalyst particularly Pd, Rh, and their halides and oxides.

Hydrogenation Catalyst

STANDARD OIL CO. *British Patent 1,259,297*

Phthalic acid is purified by the hydrogenation of impurities in the presence of Pd on C.

Hydrogenation Catalysts

BRITISH PETROLEUM CO. LTD.
British Patent 1,259,384

Naphthenes in a petroleum fraction are converted to paraffins in the presence of hydrogenation catalysts, preferably Pt or Pd incorporated with a deionised mordenite.

Disproportionation Catalyst

TORAY INDUSTRIES INC. *British Patent* 1,260,529
Toluene is converted to C_6H_6 and xylene in the presence of a catalyst such as Pd or Pt/ Al_2O_3 .

Oxidation Catalyst

MITSUBISHI PETROCHEMICAL CO. LTD.
British Patent 1,261,458
Olefins are converted to carbonyl compounds by reaction with O_2 and water vapour in the presence of a Pd or Rh salt adsorbed on to active C.

Reductive Amination

E. I. DU PONT DE NEMOURS & CO.
U.S. Patent 3,597,438
Reductive amination of aldehydes to give secondary amines is catalysed by Rh on Al_2O_3 .

Catalytic Exhaust Purifier

KLEEN AIR CORP. *U.S. Patent* 3,598,543
An exhaust purifier consists of a chamber in the exhaust pipe containing alumina spheres which have been impregnated with a Pt salt.

Hydrocarbon Hydroprocessing

UNIVERSAL OIL PRODUCTS CO.
U.S. Patent 3,600,301
Hydrocarbons are hydroprocessed over a catalytic composite of a porous carrier material, a Re component, a Group VIII noble metal component and a Sn component. A specific example of a hydrocracking catalyst is a composite of a crystalline alumino-silicate, a Pt component, a Re component and a Sn component.

Hydroprocessing of Hydrocarbons

UNIVERSAL OIL PRODUCTS CO.
U.S. Patents 3,607,727 and 3,607,728
The hydroprocessing of hydrocarbons uses a catalytic composite of a porous carrier material, a Group VIII noble metal component and a germanium component. A specific example is a composite of a crystalline alumino-silicate, a Pt component and a Ge component, for use in hydrocracking. *U.S. Patent* 3,607,728 uses Pb instead of Ge.

Catalytic Purification of Terephthalic Acid

MOBIL OIL CORP. *U.S. Patent* 3,607,921
Crude terephthalic acid is purified at elevated temperatures by contact in the presence of CO with solid particles of an adsorptive agent having substantial CO sorption capacity, e.g. Pd/C.

Catalytic Oxidation of Glucose

JOHNSON, MATTHEY & CO. LTD.
U.S. Patent 3,607,922
For the oxidation of glucose to gluconic or glucosaccharic acid, an aqueous solution of glucose containing Na or K carbonate or bicarbonate is contacted with an O-containing gas in a trickle column reactor in the presence of a

supported Pt group metal catalyst. This corresponds to *British Patent* 1,208,101.

Production of Hydrogen Peroxide by Anthraquinone Process

F.M.C. CORP. *U.S. Patent* 3,615,207
A catalyst for the production H_2O_2 by the anthraquinone process contains 0.05–5% Pd dispersed over Al_2O_3 spheres. The spheres pores are less than 0.06 μ in diameter and have a BET surface area of 20–200 m^2/g .

Hydrogenation Catalyst

PRODUITS CHIMIQUES PECHINEY-ST. GOBAIN
French Patent 2,052,022
Unsaturated impurities in ethylenic gases are hydrogenated in the presence of a catalyst which is a supported mixture of Pd and V. The selectivity of the catalyst can be varied by altering the Pd : V ratio.

HCN Production

DEUTSCHE GOLD- UND SILBER-SCHNEIDANSTALT
German Offen. 1,767,974
 H_2 and NH_3 are produced from NH_3 and acrylonitrile at 1100–1400°C in the presence of a Pt catalyst.

Dehydrogenation Catalysts

SHELL INTERNATIONALE RESEARCH MIJ. N.V.
Dutch Appl. 70.08,306
A supported dehydrogenation catalyst is produced by depositing a Group VIII noble metal, e.g. Pt on Al_2O_3 or another support and then passing an inert gas containing Cd and/or Zn over the support so that elementary metal is deposited.

Activation of Supported Catalysts

SHELL INTERNATIONALE RESEARCH MIJ. N.V.
Dutch Appl. 71.04,723
The activity of noble Group VIII metal catalysts on porous supports is increased by treatment in three stages: oxidation, sulphiding and reduction.

Platinum Metal Catalysts

SHELL INTERNATIONALE RESEARCH MIJ. N.V.
Dutch Appl. 71.05,986, *German Offen.* 2,121,765
Hydrocarbon conversion catalysts capable of regeneration are obtained by depositing a Pt metal and a second metal on a pretreated support and calcining the product. In an example an Al_2O_3 support is pretreated with Sn tartrate and calcined. Pt and additional Sn are then deposited and the product calcined a second time.

Alkyl Aromatic Compound Isomerisation

SHELL INTERNATIONALE RESEARCH MIJ. N.V.
Dutch Appl. 71.07,953
The steam isomerisation of alkyl aromatic compounds is catalysed by a hydrogenating/dehydrogenating metal deposited on a refractory metal acidic oxide, e.g. Pt/ $SiO_2-Al_2O_3$.

Rhodium Catalyst

SHELL INTERNATIONALE RESEARCH MIJ. N.V.
Dutch Appl. 71,07,603

A highly reactive Rh catalyst is obtained by contacting a Rh solution with a silica gel so that ion exchange results in the deposition of Rh on the gel surface. A suitable solution contains $\text{Rh}[\text{Cl}(\text{NH}_3)_5](\text{OH})_2$.

HOMOGENEOUS CATALYSIS

Palladium Carbonyl Complexes

OLIN CORP. *British Patent 1,251,744*
The compound $\text{PdL}(\text{CO})\text{X}_2$, where L is a Lewis base, is prepared by the reaction of (for example) pyridine, quinoline or lutidine with a Pd dihalide and CO. It is a useful catalyst for the conversion of nitro compounds to organic isocyanates. *British Patent 1,252,331* uses $\text{Pd}(\text{py})(\text{SCN})_2$.

Dimerisation Catalyst

B.P. CHEMICALS LTD *British Patent 1,254,776*
Acrylonitrile is dimerised in the presence of a Ru compound, preferably the chloride.

Hydroformylation Catalyst

BRITISH PETROLEUM CO. LTD
British Patent 1,255,858
Olefins are converted to aldehydes by hydroformylation with a Rh-dicarbonyl- β -diketone.

Catalysts

JOHNSON, MATTHEY & CO. LTD.
British Patent 1,258,045
Hydrogenation, hydroformylation and carbonylation processes using tertiary phosphine complexes with halides on pseudohalides of the Pt group metals may be improved by the use of triphenyl phosphines substituted in the para position with an electron releasing substituent.

Oxidation Catalyst

MARUZEN OIL CO. LTD. *British Patent 1,259,145*
Butene is oxidised to methyl ethyl ketone in the presence of an aqueous solution containing ferrous sulphate and a Pd compound. The sulphate, nitrate or chloride are preferred.

Production of Cyclic Hydrocarbons

IMPERIAL CHEMICAL INDUSTRIES LTD.
British Patent 1,259,973
A 1,4-cyclohexadiene is combined with a cyclopentadiene at elevated temperature and pressure in the presence of a Rh catalyst such as RhClL_3 , where L is a tertiary phosphine, arsine or stibine.

Preparation of Aromatic Isocyanates

OLIN MATHIESON CHEMICAL CORP.
U.S. Patent 3,597,466
Organic isocyanates are made by reacting an organic nitro compound with carbon monoxide

in the presence of a halide of a noble metal and a cyanamide compound. Preferred cyanamide compounds include alkyl, dialkyl, aryl, diaryl, aralkyl and diaralkyl cyanamides. The noble metal is preferably Pd, Rh, Ir, Re, Pt.

Rhodium Polymerisation Catalyst

U.S. SECRETARY OF THE ARMY
U.S. Patent 3,607,850
Conjugated dienes are polymerised in aqueous emulsion by a water-soluble Rh salt or complex.

Nitrile Polymerisation

INSTITUT FRANCAIS DU PETROLE, DES CARBURANTS ET LUBRIFIANTS *French Patent 1,603,107*
Nitrile polymerisation through the C-N triple bond is catalysed by Group VIII (e.g. Pd) cyanides and unsaturated amines.

Ruthenium Carboxylate Catalysts

JOHNSON, MATTHEY & CO. LTD.
French Patent 2,055,059
New hydrogenation catalysts are Ru carboxylates of formula $\text{Ru}_2(\text{OCOR})_4$, where R is alkyl or aryl, and their adducts with arsines, phosphines or stibines, e.g. a Ru(II) acetate-triphenyl phosphate adduct.

Transition Metal Catalysts

JOHNSON, MATTHEY & CO. LTD.
French Patent 2,055,060
New catalysts are compounds containing the cations $\text{M}_2^{\text{n}+}$, $\text{M}_2(\text{OCOR})_{4-\text{n}}^{\text{n}+}$, $\text{M}_2(\text{OSCR})_{4-\text{n}}^{\text{n}+}$ or $\text{M}_2(\text{SCSR})_{4-\text{n}}^{\text{n}+}$, where R is alkyl or aryl and M is a transition metal, especially a Pt group metal, Mo, Cr, Cu or Re.

FUEL CELLS AND BATTERIES

Fuel Cell Electrodes

UNITED AIRCRAFT CORP. *U.S. Patent 3,615,862*
Activated fuel cell electrodes are prepared by electrodeposition of a noble metal catalyst on a solid foil or porous electrode substrate. The electrolyte is an alkali metal hydroxide solution, preferably molten alkali metal hydroxide. Pd black is a preferred noble metal catalyst and Pd or Pd-Ag alloy foils and porous sintered Ni structures are the preferred electrode substrates.

CHEMICAL TECHNOLOGY

Solderable Stainless Steel

P. R. MALLORY & CO. INC.
British Patent 1,256,147
A wet electrolytic capacitor includes a glass-to-metal seal. The metal is stainless steel which is coated first with a layer of Ni, Cr or Co and then with a layer of an alloy of Ag or Cu with one or more of the following: Au, Pd, Pt, Re or Os.

Photographic Composition

MINNESOTA MINING & MANUFACTURING CO.
British Patent 1,260,722

A photosensitive medium includes a composition which on exposure to light will generate ions of a metal more noble than Ag, preferably Pd.

Flame Resistant Polymer Composition

GENERAL ELECTRIC CO. *British Patent 1,261,637*

A flame-resistant elastomer contains an organopolysiloxane, a Si hydride, filler and a Pt-containing material to give 0.5–250 parts of Pt per million parts of the organopolysiloxane.

Palladium Photographic Material

EASTMAN KODAK CO. *U.S. Patent 3,597,206*

Light sensitive Pd compounds are used in a vinyl alcoholvinyl anthranilate polymer to form a photographic material. The compounds are complexes of Pd salts and carboxylic acids.

Heat Source, Suitable for Use in a Cardiac Pacemaker

COMMISSARIAT A L'ENERGIE ATOMIQUE
U.S. Patent 3,600,586

A heat source consists of an α -emitting material in a leak-tight container. The container consists of an inner sheath of Ta or W and of an outer sheath of Pt.

Gold Flakes

E. I. DU PONT DE NEMOURS & CO.
U.S. Patent 3,615,731

Flake Au is made by milling Au powder in a liquid hydrocarbon medium containing 1–20% fatty acid. The flakes are used in metallising and decorative compositions. Harder and brighter flakes are obtained by introducing up to 1% Rh powder into the hydrocarbon media.

GLASS TECHNOLOGY

Coating for Glass

PHILIPS ELECTRONIC & ASSOCIATED INDUSTRIES LTD.
British Patent 1,251,947

A glass article, e.g. the envelope of a Na-vapour discharge lamp, is provided with a transparent heat-reflecting surface film consisting of doped Ir oxide. The dopant is preferably Sn.

Manufacture of Glass Fibres

P.P.G. INDUSTRIES LTD.
British Patents 1,259,553 and 1,259,554

Apparatus for melting and homogenising glass and drawing out glass fibres, is described. Channels and pans of Pt are included.

Platinum Coating

CORNING GLASS WORKS *U.S. Patent 3,598,635*
A material suitable for use in contact with molten

glass is obtained by spraying the surface of a refractory with Pt or a Pt alloy in a plasma flame, and heating the coated refractory to 1250°C.

Glass Bushing with High Emissivity Coating

P.P.G. INDUSTRIES INC. *U.S. Patent 3,600,146*

Pt and Pt alloys such as those used for bushings in the manufacture of glass fibre have relatively low emissivity values. Parts of such bushings are exposed to radiant energy, and to increase the radiant heat exchange a coating of a material having a relatively high emissivity is applied.

ELECTRICAL AND ELECTRONIC ENGINEERING

Ohmic Contacts for Semiconductive Wafers

HEWLETT-PACKARD CO. *British Patent 1,253,092*

In the manufacture of ohmic contacts, the contact area required on a Si substrate is coated with Pt and the PtSi subcontacts so formed are sputtered with Mo-Au.

Switching Device

PHILIPS ELECTRONIC & ASSOCIATED INDUSTRIES LTD.
British Patent 1,254,249

In the manufacture of a switching device, reed contacts of magnetic Ni-Fe alloy are coated with a layer of Au in which is dispersed at least 1 vol.% of C, P, S, Si or metal oxide. A further layer of Ru or Rh is then applied.

Porous Anode Capacitor

GENERAL ELECTRIC CO. *British Patent 1,254,633*

It has been found that Ti- and Ni-case capacitors enhanced with Ru are significantly superior to those enhanced with Pt, Pd or Rh.

Electrodes

BADISCHE ANILIN- & SODA-FABRIK A. G.
British Patent 1,258,619

Pt/Ti or Pt foil on graphite is used as the anode in the production of adiponitrile by electrochemical hydrodimerisation of acrylonitrile.

Ceramic Metallising Compositions

E. I. DU PONT DE NEMOURS & CO.
British Patent 1,260,023

A brazeable metallising composition consists of 90–99 wt.% of at least one of Pt, Pd, Au, Ag, Rh, Ru, Os and Ir, and 1–10 wt.% of a glass.

Printed Circuits

E. I. DU PONT DE NEMOURS & CO.
British Patent 1,260,440

A photopolymerisable composition suitable for forming patterns on inorganic dielectric substrates consists of an organic solvent, and a solid component containing 5–85 wt.% of an organic compound of Ru, Os, Rh, Ir, Pd, Pt, Ag or Au, together with a photopolymerisable aliphatic

compound, an organic sensitiser, an organic S compound and flux.

Anodes

P.P.G. INDUSTRIES INC. *British Patent 1,260,645*
Anodes which may be used for electrolysis of aqueous alkali metal chloride solutions are coated with an electroconductive oxygen-containing compound which includes a Pt group metal and an alkaline earth or rare earth metal. Examples are Ca or Sr ruthenate or ruthenite.

Anodes

FARBENFABRIKEN A.G. *British Patent 1,261,114*
Anodes suitable for use in the electrolytic production of olefin oxides from olefins may be made of Pt, Ti coated with one or more Group VIII noble metals (especially Pt with Ir and Rh), Pt-Ta or a Pt-coated inert support.

Electrode for Cardiac Stimulator

MEDTRONIC INC. *U.S. Patent 3,596,662*
A cardiac stimulator electrode has a pair of electrical conductors encapsulated in a flexible nonconductive plastic material, such as silicone rubber. The electrical conductors are Pt alloy coil springs with space coils.

Electroconductive Glaze

PRECISION ELECTRONIC COMPONENTS LTD.
U.S. Patent 3,607,789
A conductive glaze consists of conductive particles in a Pb germanate glass. A suitable composition contains Au, Pt oxide and Ru oxide.

Metallising Material

ALPHA METALS INC. *U.S. Patent 3,609,105*
A metallising composition for forming electrically conductive areas on dielectric materials is a mixture of 63.7% Au, 32.3% Pd and 4.0% Ag.

Bismuth Titanate Film Capacitor

SYLVANIA ELECTRIC PRODUCTS INC.
U.S. Patent 3,609,482
A film capacitor is made by depositing a base electrode of a Au-Pd alloy on an Al₂O₃ substrate. A dielectric paste of a mixture of Bi titanate, a Pb borosilicate glass and a resin solution is silk screened on to the base electrode and then baked and fired. An upper electrode of Ag is deposited on the Bi titanate.

High-temperature Semiconductor

T.R.W. SEMICONDUCTORS INC.
U.S. Patent 3,609,472
A contact for a semiconductor device capable of withstanding high temperature, chemical attack by silicon etchant and high oxidation atmospheres has a bimetallic layer of an alloy of Pt and Ni on the active regions. The Pt-Ni layer is coated with Pt and this is protected by a covering layer of Rh. A layer of Au is then placed on the Rh.

Brazeable Metallising Compositions

E. I. DU PONT DE NEMOURS & CO.
U.S. Patent 3,615,734
Brazeable compositions which can be fired below 1400°C consist of 90–99% noble metal(s) and 1–10% of a low-alkali aluminosilicate glass. The noble metals contain at least 50% Pt with a surface of 0.05–5 m²/g.

Oxygen Sensor

WESTINGHOUSE ELECTRIC CORP.
U.S. Patent 3,616,408
An oxygen solid-electrolyte cell has two longitudinal holes, the interiors of which are coated with porous Pt. The holes are connected to separate sources of gas to permit flow of different gases over the electrodes within the holes.

Electrolysis Electrodes

P.P.G. INDUSTRIES INC. *U.S. Patent 3,616,446*
Electrolysis electrodes consist of a Ti or other conducting base coated with an electroconductive oxy-compound of a Pt group metal and either a Group IIA or Group IIIA metal. A typical coating is produced by applying Rh and Mg resins and heating the resulting film.

Electrode for Formic Acid Combustion

ROBERT BOSCH G.m.b.H.
German Offen. 1,671,418
An electrode for the electrochemical combustion of formic acid consists of a combination of Pt or Pt alloy plus a Group V or VI element on a conducting base.

Plasma Electrodes

FARBENFABRIKEN BAYER A.G.
German Offen. 2,025,897
Electrodes for the plasma heating of gases containing O₂, e.g. for TiO₂ production, consist of an alloy of 10–65% Pd, 20–65% Au and 15–50% Ag.

TEMPERATURE MEASUREMENT

Thermocouple

S. COUDRIER *British Patent 1,251,081*
A thermocouple is produced by depositing separated areas of two different metals on to an insulating substrate of suitable geometry. Electric leads are provided from the metal areas to a measuring instrument. The metals used may be Pt and Pt-Rh.

Determination of Oxygen

UNITED STATES STEEL CORP.
British Patent 1,255,417
An apparatus for determination of dissolved O₂ in molten steel includes a Pt : 10% Rh-Pt thermocouple.