

Pt:10% Rh-Pt thermocouples were compared at 50°C intervals from 630.74–1064.43°C. The standard deviation with the resistance thermometers was ≈ 4 mK, and 25–30 mK with the thermocouples. Values on IPTS-68 could be determined with a single thermometer with one-third of the uncertainty of a single thermocouple. If a practical temperature scale were redefined using Pt resistance thermometers it could be realised with less uncertainty than IPTS-68.

Effect of Pressure on the Thermal E.M.F. of the Platinum/Platinum-10 per cent Rhodium Thermocouple

P. M. BELL, F. R. BOYD and J. L. ENGLAND, *Nat. Bur. Stds. Spec. Publ. 326*, (Mar.), 63–65

The effect of pressure on the e.m.f. of a Pt:10% Rh-Pt thermocouple was measured. Pressure decreases the thermal e.m.f., so that a positive correction to the thermocouple reading is required at pressures above atmospheric. The effect increases non-linearly with temperature and pressure. The maximum effect was 20 μ V at 509°C and 3.5 kbar corresponding to an apparent correction of 2°C.

Effect of Pressure on the E.M.F. of Thermocouples

I. C. GETTING and G. C. KENNEDY, *Ibid.*, 77–80

If the temperature of a thermocouple junction at high pressure is different to that where the elements emerge into a low pressure environment, substantial effects on the thermal e.m.f. are observed. Measurements on Pt and 10% Rh-Pt single wire are used to formulate a correction graph for Pt: 10% Rh-Pt thermocouple readings under these conditions.

Temperature Measurement by Thermal Noise at High Pressures

R. H. WENTORF, *Ibid.*, 81–89

The temperature of a small C resistor (700–3000 ohm) in a high pressure cell next to a Pt: 10% Rh-Pt thermocouple was measured by thermal noise. Runs were made at 40 and 50 kbar up to 1,400 K. At high temperatures the thermocouple indicated a temperature 40–60 K too low, in fairly good agreement with estimates made by other methods.

Sensor-lance for BOF Control

D. W. KERN, P. D. STELTS and R. J. FRADENECK, *J. Metals*, 1971, 23, (8), 9–19

A sensor-lance for monitoring turndown C and temperature is being used at Bethlehem Steel's basic oxygen furnace shop. The sensors contain Pt:10%Rh-Pt or 6%Rh-Pt:30%Rh-Pt thermocouples. Use of this system has increased the accuracy of turndown C and temperature control, doubled the heats ready to tap at first turndown and decreased the heat time.

Amorphous Alloy Resistance Thermometer Development

C. R. TALLMAN, *Adv. Instrumentation (Proc. 25th Ann. I.S.A. Conf.)*, 1970, 25, (2), paper 619, 6 pp

A unique resistance thermometer with enhanced sensitivity at cryogenic temperatures is described. It uses an amorphous 7%Cr-20%Si-Pd alloy whose resistivity is greatest at 4 K, and decreases with increasing temperature up to 600 K. The sensitivity is greater than that of Pt below 20 K. The thermometer was developed for use in a nuclear environment; the design concepts, theory and results are discussed.

NEW PATENTS

METALS AND ALLOYS

Permanent Magnetic Alloy

CITIZEN WATCH CO. LTD. *U.S. Patent 3,591,373*
A permanent magnetic alloy contains 15–40 at.% Pt, 5–35 at.% Au and 40 at.% Fe.

Dispersion Strengthened Metals

JOHNSON MATTHEY & CO. LTD.
German Offen. 2,102,980 Dutch Appl. 71.00,842
Au, Ag and Pt metals and their alloys are hardened by internal oxidation of an additive such as Zr. After addition of Zr the alloy is powdered, cold worked and exposed to a gas which converts the Zr to a stable refractory oxide, ZrO₂. The product is compacted and sintered.

CHEMICAL COMPOUNDS

Rhodium Complexes

BRITISH PETROLEUM CO. LTD.
British Patent 1,249,303

In the manufacture of Rh complexes, a Rh carbonyl carboxylate is reacted with a reagent (containing at least one active H atom) which is either a β -diketone or a Schiff base of a β -diketone. This gives a complex of the type Rh(CO)₂acac.

ELECTROCHEMISTRY

Hydroquinone Production

K. DURKES *German Offen. 1,953,951*
The electrochemical oxidation of C₆H₆ to hydro-

quinone uses Ti electrodes which contain 0.1-0.5 wt.% Fe and are coated with Pt metals.

ELECTRODEPOSITION AND SURFACE COATINGS

Electrodeposition of Rhodium

DEUTSCHE GOLD-UND SILBER-SCHNEIDANSTALT
British Patent 1,244,720

Thick craze-free Rh coatings are deposited from a bath containing a Rh sulphite-sulphate complex.

Palladium-Nickel Alloy Plating Bath

KABUSHIKI KAISHA SUIVA SEIKOSHA and
NISSHIN K. K. *U.S. Patent 3,580,820*

A Pd-Ni alloy plating bath contains an ammoniacal solution of a Pd salt and a Ni salt. A sulphionate or a sulphamide brightener is added.

Bright Palladium Plating

V.E.B. BERGBAU- & HUTTENKOMBINAT
German Offen. 1,621,188

Bright Pd plating is achieved using plating baths with added reducing agent, e.g. a hydrazine compound.

LABORATORY APPARATUS AND TECHNIQUE

Palladium Tube in Gas Analysis

CALIFORNIA INSTITUTE OF TECHNOLOGY
U.S. Patent 3,589,171

Sequential analytical determination of a vapour sample is performed by suspending the sample in a H₂ carrier gas, or a mixed carrier gas of H₂ and He, and passing the suspension through a gas chromatograph. More than 90% of the H₂ is removed from the effluent by passing it through a heated Pd tube before analysis.

JOINING

High Temperature Brazing Alloys

WESTERN GOLD & PLATINUM CO.
U.S. Patent 3,577,233

Brazing alloys contain 25-70% Au, 5-30% Pd, 15-40% Ni, 4-12% Cr and 0.01-2% Y. These alloys have substantial ductility and high oxidation and corrosion resistance at 870-980°C and above for 100 hours or more. They are useful for joining stainless steel and super-alloys in aircraft, spacecraft, engines and components.

HETEROGENEOUS CATALYSIS

Hydrocarbon Steam Reforming

IMPERIAL CHEMICAL INDUSTRIES LTD.
British Patent 1,240,453

A catalyst, for steam reforming hydrocarbons

with decreased C lay-down, contains Ni and/or Co, a Pt metal and a refractory oxide support. The support contains more than 5% alkaline earth metal oxide (calculated as CaO) but less than 0.5% alkali metal compounds (calculated as K₂O). Ru is the preferred Pt metal.

Catalyst

UBE INDUSTRIES LTD. *British Patent 1,241,255*
C₃H₆ is converted to acrylonitrile by reaction with O₂ and NH₃ in the presence of a catalyst which contains 80-98 wt.% of a solid solution of Sb oxide and SnO₂, and 2-20 wt.% of one or more oxides of In, Ir or Ru.

Cracking Catalyst

RUHRCHEMIE A.G. *British Patent 1,241,646*
Isobutyraldehyde is decomposed to C₃H₆, CO and H₂ in the presence of Rh and/or Pt.

Desulphurisation

BRITISH PETROLEUM CO. LTD.
British Patent 1,242,889

S is removed from hydrocarbon fractions by the action of H₂ in the presence of a crystalline mordenite of reduced alkali content and a catalytically active metal, preferably Pt or Pd.

Hydrofining Catalyst

TEXACO DEVELOPMENT CORP.
British Patent 1,242,962

The properties of lubricating oils are improved by treatment with H₂ in the presence of 0.1 to 5% Pt or Pd on a H-form mordenite base.

Hydrocracking Catalyst

MOBIL OIL CORP. *British Patent 1,243,366*

A hydrocracking catalyst consists of an active inorganic oxide supporting a catalytically active metal such as Pt or Pd.

Hydrogenation Catalyst

TEXACO DEVELOPMENT CORP.
British Patent 1,247,656

The first stage in the production of a lubricating oil is the mild hydrogenation of a suitable stock in the presence of a Group VIII metal, e.g. Pd or Pt or an oxide or sulphide thereof.

Hydrocarbon Reforming Catalyst

IMPERIAL CHEMICAL INDUSTRIES LTD.
British Patent 1,249,466

A hydrocarbon reforming catalyst contains a Pt group metal (preferably Ir or Ru) and an alkaline earth oxide such as CaO.

Oxidation Catalyst

KNAPSACK A.G. *British Patent 1,250,265*

Unsaturated esters of carboxylic acids are obtained by the oxidation of olefins in the presence of a Pd catalyst.

Hydrogen Cyanide Production

W. R. GRACE & CO. *U.S. Patent 3,577,218*
A mixture of NH_3 and CH_4 is reacted over a Pt/mullite catalyst to give high yields of HCN. The catalyst is prepared by depositing Pt on either natural or synthetic mullite. It has improved stability and avoids carbonitridation.

Isomerisation of Alkyl Aromatics

CHEVRON RESEARCH CO. *U.S. Patent 3,577,475*
Alkyl aromatic hydrocarbons are isomerised in the presence of H_2 with a catalyst consisting of a porous solid carrier containing 0.01–3 wt.% Pt group component and 0.01–5 wt.% Re.

Cyclic Regenerative Platinum-Rhenium Reforming Process

CHEVRON RESEARCH CO. *U.S. Patent 3,578,582*
In a cyclic regenerative reforming process where a S-free naphtha fraction is contacted with a Pt group metal-Re catalyst under reforming conditions, the process is started by sulphiding the catalyst in situ with 0.05–2 moles of S per mole of the Pt group metal-Re present.

Reforming Process with Promoted Low Platinum Content Catalyst

CHEVRON RESEARCH CO. *U.S. Patent 3,578,583*
A naphtha is reformed in the presence of H_2 with a catalyst consisting of 0.01–0.3% Pt, 0.01–0.3% Re and 0.001–0.1% Ir on a porous carrier.

Hydrocarbon Conversion Platinum-Germanium Catalyst

UNIVERSAL OIL PRODUCTS CO.
U.S. Patent 3,578,584
A hydrocarbon conversion catalyst consists of 0.01–2.0% of Pt group metal, 0.01–5.0% Ge and 0.5–3.5% halogen on a porous carrier.

Hydrocracking of Naphtha

MOBIL OIL CORP. *U.S. Patent 3,579,434*
0.05–5.0% Pd deposited on a chelated hydrogen-form of zeolite Y is used as a catalyst for hydrocracking naphtha to LPG.

Dehydrogenation Catalyst

UNIVERSAL OIL PRODUCTS CO.
U.S. Patent 3,584,060
Hydrocarbons are dehydrogenated by contacting them in dehydrogenation conditions with a catalytic composite of a Pt group component, a Re component, a Sn component and a carrier.

Hydrocarbon Dehydrogenation

SINCLAIR RESEARCH INC. *U.S. Patent 3,586,730*
4–5C hydrocarbons are dehydrogenated in the vapour phase in the presence of a catalyst consisting of a small amount of a Pt group metal, 5–50% Cr_2O_3 , 0.1–2% alkali metal and 30% activated Al_2O_3 .

Catalytic Wall

S. A. FRANCAISE DU FERODO
U.S. Patent 3,589,853
A catalytic wall is permeated by a gas flowing from an internal to an external face where it reacts with another gas. The wall consists of an asbestos-based fabric support which has less catalyst on the internal than on the external face. It can be used in a catalytic heater apparatus. Pt is a suitable catalyst.

Heterogeneous Catalyst Process

ESSO RESEARCH & ENGINEERING CO.
U.S. Patent 3,591,656
Heterogeneous conversion catalysts are prepared by forming complexes between a reduced transition metal, e.g. a Pt metal and a support in an inert atmosphere. The complex is stabilised by heating. The catalysts may be used for the conversion of organic feed compounds in the presence of H_2 .

Propylene Production

UNIVERSAL OIL PRODUCTS CO.
U.S. Patent 3,592,867
 C_3H_8 is dehydrogenated to C_3H_6 in the presence of a non-acidic Pt metal catalyst, e.g. Pt or Pd/ Al_2O_3 . Hydrocracking C_3H_6 to form C_2H_4 is carried out over a Group VIII metal catalyst such as Ni or Rh.

Aryl Dealkylation

G. N. MASLYANSKII et al. *U.S. Patent 3,595,932*
Alkyl benzenes are dealkylated with steam at 380–600°C in the presence of a catalyst. The catalyst is a binary system consisting of 0.05–5 wt.% Pt, Pd, Rh, Ir and/or Ru on Al_2O_3 , an aluminosilicate, or a combination of Al_2O_3 , with oxides of Ni or Co.

Oxidation of Methane and Low Hydrocarbons

JOHNSON MATTHEY & CO. LTD.
French Appl. 2,061,384
Methane and other hydrocarbons produced in car exhausts are oxidised to CO_2 and H_2O over a catalyst consisting of 35% Rh-Pt on a porous ceramic honeycomb structure such as mullite.

Hydroxylamine Production

FARBENFABRIKEN BAYER A.G.
German Offen. 1,667,045
A catalyst for the reduction of NO to NH_2OH is obtained by hydrolysing a soluble Pt compound in the presence of strong acid. PtO_2 is deposited on a support and is reduced to Pt metal.

Platinum Catalysts

JOHNSON MATTHEY & CO. LTD.
German Offen. 1,667,107
Pt in active adherent form, or mixtures of Pt

with up to 50% of other Pt group metals, are deposited on supports using a dispersion in a C₂-C₅ aliphatic alcohol.

Glucose Oxidation

JOHNSON MATTHEY & CO. LTD.

German Offen. 1,668,282

Glucose is oxidised to gluconic acid or gluco-saccharic acid in high yield using a supported Pt metal.

Palladium Catalyst

INSTITUT KHMICHESKIKH NAUK A.N. KAZAKHSKI S.S.R. *German Offen.* 2,001,291

Pd catalysts are produced by impregnating Al₂O₃ with an aqueous alcoholic solution of Na₂PdCl₄. Another Group I or VIII salt may also be present, e.g. H₂PtCl₆, to give a mixed catalyst.

Selective Catalyst

JOHNSON MATTHEY & CO. LTD.

German Offen. 2,061,226

A selective, poison-resistant catalyst is made by dispersing a Pt compound in an aliphatic alcohol which is polymerised and carbonised to form a Pt-containing C molecular sieve.

Catalytic Hydrogenation of *m*-Nitroacetophenone

JOHNSON MATTHEY & CO. LTD.

German Offen. 2,116,761

Aromatic nitro compounds containing carbonyl groups are reduced to amines by contacting the nitro compounds with H₂ in the presence of Pd/celite. The carbonyl group is unaffected.

Ammonia Oxidation Catalyst

M. A. MINIVICH et al. *Dutch Appl.* 69,18,466

NH₃ is oxidised to NO in the presence of an alloy of Pt as catalyst. The alloy contains 75-82% Pt, 15-22% Pd, 2-3.5% Rh, 0.05-0.15% Au, Fe and Ir and optionally 0.15-2% Ru.

Catalysts for Combustion of Propane and Town Gas

MATSUSHITA ELECTRIC INDUSTRIAL CO. LTD.

Japanese Patent 70,37,308

Pd/asbestos catalyst is prepared by immersing asbestos in a solution containing ferrosilicon and PdCl₂, and heating in N₂ to decompose the PdCl₂. The resulting catalyst has a high activity for combustion of C₃H₈ and town gas.

HOMOGENEOUS CATALYSIS

Butadiene Polymerisation Catalyst

W. R. GRACE & CO. *British Patent* 1,243,075

PdCl₂ is reacted in an inert solvent and in the presence of Na₂CO₃ with an olefin to form a Pd allyl complex which is a useful butadiene polymerisation catalyst.

Hydroformylation Catalysts

BRITISH PETROLEUM CO. LTD.

British Patents 1,243,189 and 1,243,190

Mixed-ligand complexes of Os, Ir or preferably Rh are useful catalysts for the conversion of olefins to aldehydes or alcohols. The ligands are preferably a tertiary phosphine, CO and a β-diketone.

New Friedel-Crafts Catalysts

RHONE-POULENC S.A. *British Patent* 1,244,311

Proposed new Friedel-Crafts catalysts are the halides of Ru, Rh, Os or Ir.

Polymerisation Catalyst

ORGANSKO HEMIJSKA INDUSTRIJA 'NAUM NAUMOVSKI BORCE' *British Patent* 1,244,988

Vinyl polymers are produced in the presence of a catalyst which is a metal salt of EDTA, diethylenetriaminepentaacetic acid or cyclohexanediamine tetraacetic acid. The metal may be Pd.

Ruthenium Hydride Complexes

IMPERIAL CHEMICAL INDUSTRIES LTD.

British Patent 1,246,123

Complexes which are very efficient hydrogenation catalysts in homogeneous media are obtained by reacting in solution a simple Ru salt, H₂ and a ligand forming reagent, e.g. a tertiary phosphine.

Hydroformylation Catalyst

B.P. CHEMICALS LTD. *British Patent* 1,248,988

Olefins are converted to aldehydes by reaction with CO and H₂ in the presence of a carbonyl-tertiary phosphine complex of Os or Ru.

Polymeric Catalyst

IMPERIAL CHEMICAL INDUSTRIES LTD.

British Patent 1,249,033

A polymeric catalyst consists of a metallated polymer which is a polystyrylphosphine having transition metal atoms coordinated to the P atoms. The metal may be Pt or Pd.

Production of Carboxylic Acids

MONSANTO CO.

U.S. Patents 3,579,551 and 3,579,552

The preparation of carboxylic acids by the reaction of ethylenically unsaturated compounds with CO and water is catalysed by Rh and Ir compounds together with an I promoter.

Copolymerisation of Carbon Monoxide with Alkyene Oxide

UNION CARBIDE CANADA LTD.

U.S. Patent 3,590,075

Copolymers of CO and alkyene oxides are prepared by polymerising the monomers at elevated temperatures and pressure in the presence of a salt of a Group VIII metal and an amine or alkanolamine. The salts are halides or carbonates.

Rhodium Ammino Complex Catalysts

JOHNSON MATTHEY & CO. LTD.
German Offen. 1,668,248

Water-soluble unsaturated organic compounds, especially carboxylic acids are catalytically hydrogenated in the presence of a Rh complex containing the cation $\text{HRh}(\text{NH}_3)_5^{2+}$ or $\text{HRh}(\text{NH}_3)_4\text{H}_2\text{O}^{2+}$. This corresponds to *British Patent* 1,197,723.

Reaction Catalysts

JOHNSON MATTHEY & CO. LTD.
German Offen. 2,053,218

Hydrogenation, hydroformylation or carbonylation may be carried out using a solution of $\text{RhH}(\text{CO})(\text{MR}_3)_2$ or $_3$ where M is P, As or Sb or solutions of similar Pt group metal complexes also containing halogen. The solution is allowed to pass through a particle-bed; the reactant gas stream flows concurrently or countercurrently through the bed.

Rhodium Complexes in Catalytic Reactions

JOHNSON MATTHEY & CO. LTD.
German Offen. 2,064,471
Dutch Appl. 70.18,912

Hydrogenation or hydroformylation of olefinically unsaturated compounds in the absence of an inert solvent may take place in the presence of a hydrido carbonyl complex of Rh(I) and a P-containing stabilising donor ligand.

Ruthenium-Phosphine Complexes

SHELL INTERNATIONALE RESEARCH MIJ. N.V.
Dutch Appl. 70.18,017

Methyl esters of linear saturated carboxylic acids are produced by the reaction of C_2H_4 and CH_3OH in the presence of a Ru-phosphine complex.

CHEMICAL TECHNOLOGY

Photosensitive Palladium Compounds

EASTMAN KODAK CO. *British Patent* 1,240,705
Radiation-sensitive Pd compounds have the formula $[\text{Pd}(\text{L})_x]_y\text{M}_z$, where L is a ligand, M is H ion, acid ion, or onium ion, x is 0-4, y is 1-4, z is 0-2. Potassium palladium oxalate is mentioned in one example. The use of the developer is described in *British Patent* 1,240,706, and the compound in *British Patent* 1,240,707.

Decalomania

PRECISION STUDIOS LTD. *British Patent* 1,240,832
Decalomania for ceramic decoration consist of a paper support printed with oxides of Sn, Pb, Sb and Fe in an ethyl cellulose medium. This in turn is coated, while still tacky, with a Au, Ag and/or Pt powder. The surplus dust is removed and the product is lacquered.

Electrolytic Hygrometer Detector Element

CENTRAL ELECTRICITY GENERATING BOARD
British Patent 1,245,025

A hygrometer detector element is made by (a) filling a grooved plate with platinising paste, (b) firing, (c) rhodium plating and (d) coating with a hygroscopic electrolytic material, e.g. H_3PO_4 .

Photographic-film Coating

EASTMAN KODAK CO. *British Patent* 1,245,947

An additive for a photographic Ag halide emulsion consists of a mixture of gelatine, a water-soluble latex polymer and a salt of a polyvalent metal such as Rh, Ir or Pt.

Activated Electrode for Brine Electrolysis

IMPERIAL CHEMICAL INDUSTRIES LTD.
U.S. Patent 3,578,572

A Pt metal-coated Ti electrode for use in the electrolysis of brine is obtained by electroplating the Pt group metal on to Ti from an electrolyte containing a polybasic, hydroxy organic acid. The electrode is thereby activated. See also *U.S. Patent* 3,592,750.

Protective Coating for Plasma Apparatus

LA SOUDURE ELECTRIQUE AUTOGENE
U.S. Patent 3,578,943

Plasma nozzles used in operations with reactive gases are protected by coating one face of the nozzle, preferably the front face, with Au, Pt, Pd, Rh, Ir, Os, Ru or their alloys.

Diffusion Cell

JOHNSON MATTHEY & CO. LTD.
French Patent 2,032,780

A diffusion cell for the separation of H_2 from gaseous mixtures uses Ag-Pd alloy as H_2 -permeable membranes.

Platinum Spinnerettes

GRUNZWEIG & HARTMANN A.G.
German Offen. 2,003,168

Spinnerettes are made from Pt alloyed with another metal, e.g. Ni, which is removed by thermal treatment before and/or during use. See also *German Offen.* 2,003,161

Hydrogen-permeable Membrane

H. F. A. TOPSOE *Dutch Appl.* 70.18,485

H_2 is purified by its selective passage through a membrane of a Pd alloy containing 0.05% B.

GLASS TECHNOLOGY

Heat Reflecting Glass

ASAHI GLASS CO. LTD. *British Patent* 1,241,889

A heat-reflecting glass is produced by dispersing microscopically divided metallic Pd into a film of metal oxide which has a higher refractive index

than that of the glass. The metal oxide containing Pd is then deposited on the surface of the glass.

Glass Fibre Production

PILKINGTON BROTHERS LTD.

British Patent 1,242,921

A die plate for drawing glass fibre consists of a main body of Pt-Ir-Rh alloy faced with Pt-Ir-Rh containing small amounts of Pd, Au and Cu.

Reinforced Glass

COURTAULDS LTD.

British Patent 1,244,721

Molten glass is poured on to filaments of C or graphite which have been metal coated by conventional means. The metal is Rh, Pd or Ru.

Glass Fibre Production

W. H. W. SCHULLER

British Patent 1,250,642

Glass filaments are drawn from nozzles in the base of an elongated drawing trough which is made of a noble metal, e.g. Pt.

Heat Resistant Metals

JOHNSON MATTHEY & CO. LTD.

German Offen. 1,621,264

An article for use at high temperature, e.g. a stirrer in contact with molten glass, consists of a core of a refractory metal (Nb, Ta, Cr or Mo flame-sprayed with Zr and ZrO_2), a barrier layer of a refractory carbide, silicide, boride, sulphide, nitride or oxide and a cladding of a Pt group metal or alloy. The pressure in the interfacial space between core and sheath may be reduced.

Alloy for Handling Molten Glass

DEUTSCHE GOLD-UND SILBER-SCHNEIDANSTALT

German Offen. 1,950,468

Articles used in handling molten glass are made from an alloy of Pd containing 10-30% Rh and/or Ir and/or 30-50% Pt.

Platinum Clad Niobium, Tantalum etc.

JOHNSON MATTHEY & CO. LTD.

German Offen. 2,113,437

A refractory core of metals or alloys of Nb, Ta, Cr, Zr, V, Hf or Re are sheathed in a Pt group metal or alloy. A barrier layer of MgO and an inert gas, e.g. Ar are between the core and the sheath. Applications are stirrers, crucibles etc. in contact with molten glass.

ELECTRICAL AND ELECTRONIC ENGINEERING

Ohmic Contacts for Semiconductors

INTERNATIONAL BUSINESS MACHINES CORP.

British Patent 1,244,903

Ohmic contacts for semiconductors are formed by vapour deposition of Mo on to an area of a Pt or PdSi.

Circuit Boards

E. I. DU PONT DE NEMOURS & CO.

British Patent 1,246,784

Green ceramic boards are screen stencilled with a paste of nonoxidisable gas-free precious metal particles and a temporary binder and fired. The metal may be Pt, Pd, Au, Ag or their alloys.

Noble Metal Patterns

R.C.A. CORP.

British Patent 1,247,973

A metallic pattern may be produced on a surface such as glass with a mixture of an organic photoresist and a substantially transparent metal resin. Resinates of Au, Pt or Pd may be used.

Semiconductor Device

BATTELLE DEVELOPMENT CORP.

British Patent 1,250,201

A semiconductor device is obtained by deposition of a semiconductor material on to an insulating surface which has been marked with a suitable metal. Suitable metals are Rh, Os, Ir or Re.

Semiconductor Devices

FERRANTI LTD.

British Patent 1,250,248

Semiconductor devices are provided with beam leads consisting of layers of Ti, Pt and Au.

Conductive Oxides

E. I. DU PONT DE NEMOURS & CO.

U.S. Patent 3,583,931

Electrically conductive oxides of formula $Bi_2M_2O_7$, e.g. $Bi_2Ru_2O_7$ and $Bi_2Ir_2O_7$, and modifications of these oxides, e.g. $PbBiRu_2$ and $BiNdIr_2O_7$, are prepared by firing together the appropriate precursors, e.g. the respective oxides. The compounds are useful in electrical resistors.

Schottky Barrier Diodes as Impedance Elements

BELL TELEPHONE LABORATORIES INC.

U.S. Patent 3,585,412

Schottky barrier diodes are made in semiconductor integrated circuit arrays by forming Rh silicide on relatively high resistivity p-type Si. Such diodes are particularly useful in the loads of flip-flops used as cells of a semiconductor memory.

TEMPERATURE MEASUREMENT

Thermocouple

VEREINIGTE OSTERREICHISCHE EISEN-UND STAHLWERKE A.G.

British Patent 1,243,028

A device for continuously measuring the temperature of metal baths in melting or refining furnaces (particularly converters) consists of a thermocouple e.g. of Pt-Rh and Pt enclosed in a protective sheath.