

Ba or Th. At the high temperature of operation, 1000–2000°K, vaporisation and transfer of cathode material to the grid occurs. The grid is thus made of material having a low emission (high release function) when coated with Ba or Th. Several grid materials were tested. "K material" consisting of a Pt surface separated from the core by a layer of very fine carbide particles is used with a Th cathode. It has a high release function, high radiation constant and relatively low R.F. resistance. When working at a temperature of about 1600°K the emission remains practically unchanged after 1000 hours operation with an input of 15 W/cm² and even with 40 W/cm² the emission is still lower than the initial value for the conventional Pt clad Mo grid. For a Ba cathode the Pt is replaced by Au. A triode developed to test this material under working conditions was able to deliver 120 W at 890 Mc/s or 400 W at 500 Mc/s.

New Jobs for Ions—"Solion"

ANON., *Chem. Eng. News*, 1957, 35, (July 8), 24
The U.S. Naval Ordnance Laboratories have developed an electrolytic unit, "solion", which may replace vacuum tubes and transistors in a wide range of electronic applications. Its internal make up varies with the application but an acoustical type uses Pt electrodes in a solution of potassium iodide and iodine. Changes in conditions such as sound, temperature, pressure and acceleration alter the current and this is used to operate control devices. Among the advantages of the solion are low power needs, high sensitivity and accuracy, small size and easy maintenance.

TEMPERATURE MEASUREMENT

Inspector for Immersion Thermocouples

ANON., *Steel*, 1957, 140, (May 27), 102
A recording pyrometer and thermocouple circuit monitor, installed by the Copperweld Steel Co., work together to obtain accurate steel melting temperatures. Each time a temperature reading is taken the thermocouple is momentarily connected into the monitoring circuit. The pyrometer reading then indicates any excess

resistance due to faults in the thermocouple circuit and corrects them. The instrument can also be used to detect short circuits. The net effect is to extend the average life of each Pt couple from 25 to 35 immersions.

Temperature Controller for Steel Melting

ANON., *AEG-Mitt.*, 1957 (3/4), 117-118
A Pt:Pt-Rh thermocouple with a portable recording and regulating unit is described. The basic circuit diagram is given. The instrument enables the temperature together with the time and position of the measurement to be recorded. Temperatures of up to 1650°C can be measured with an accuracy of +5°C.

Measurement of Open Hearth Bath Temperature

Y. MITARASHI *et al*, *Tetsu to Hagane*, 1956, 42, (Sept.), 740-742 (In Japanese)
The thermocouples used in the Japanese iron and steel industry are Pt:Rh-Pt with wires 4 m. or 1 m. long. They are enclosed in a silica sheath protected by a mild steel head inserted into a steel tube with a graphite plug. Temperature measurements were carried out in four steel plants over a period of six months. Over 98% of the readings were good and the causes of failure in the remaining cases were analysed. In the good measurements standard deviations in tapping temperature of 10°C or less are frequent with a maximum deviation of 30°C.

The Error of Thermocouple Pyrometers used in the Furnaces of Steel Works

M. JINDAI *et al*, *Tetsu to Hagane*, 1956, 42, (Sept.), 751-752 (In Japanese)
Regular calibrations and a knowledge of the causes of failure have increased the reliability of measurements at the Sumitomo Metal Works. The most frequent causes of failure were due to deterioration of the Pt:Rh-Pt couples through over-heating and fire damage to the protective sheaths. In normal furnaces where a high degree of accuracy is not required, calibration once every six months is sufficient. However, in the latest heat treatment furnaces extremely accurate thermocouples are required and calibration at least every three months is necessary.

NEW PATENTS

Preparation of Pregnane Derivatives

ORGANON LABORATORIES LTD. *British Patent* 774,082

A platinum or palladium catalyst is used in a process for preparing pregnane derivatives from 11-dehydrosarmentogenin.

Preparing Derivatives of Etiocholanolic Acid

N. V. ORGANON. *British Patent* 774,083
A platinum or palladium hydrogenation catalyst

is used in the preparation of derivatives of etiocholanolic acid by oxidation of pregnane compounds.

Liquid Phase Dehydrohalogenation Process
DOMINION TAR & CHEMICAL CO. LTD. *British Patent* 774,125

Organic halogen-containing compounds of specified general formula are dehydrohalogenated by maintaining the bulk of the compound in the molten state in a receptacle and contacting part

of the compound with a hot surface which is immersed in the molten compound; the surface is maintained at a temperature of 600-1200°C, preferably 800-1100°C. The hot surface consists of an electrically conductive material, such as platinum.

Sliding Contacts

HENSCHEL & SOHN G.m.b.H. *British Patent 774,159*
Contact members composed of, or coated with, platinum are used in an arrangement of sliding contacts which remain closed for single pole generators and employing a short path contact conducting fluid path, e.g. mercury.

New Unsaturated Esters, Ethers and Aldehydes

F. HOFFMANN-LA ROCHE & CO. A.G. *British Patent 774,462*

A palladium-lead catalyst may be used as a hydrogenation catalyst in the preparation of the novel compounds.

Catalysts

ROHM & HAAS G.m.b.H. *British Patent 775,401*
A platinum catalyst for use in reactions between a gaseous hydrocarbon and another gas or gases is composed of a gauze of platinum or platinum alloy, the marginal edges of the gauze, which, during the reaction, are at a lower temperature than the reaction temperature, being embedded in a completely gas-tight manner in a refractory material, e.g. aluminium oxide, zinc oxide or magnesium oxide. In this way, the deposition of carbon on the gauge, leading to corrosion and destruction of the catalyst is avoided.

Catalytic Fume Incinerator

H. R. SUTER *et al.* *British Patent 775,549*
A catalytic fume incinerator comprises a pair of parallelly arranged metallic screens with a filling wire contacting the screens at numerous points. The metallic wire is formed of a core of a nickel-chromium or a nickel-chromium-iron alloy, coated with amorphous platinum, palladium, osmium, rhodium or iridium or mixtures thereof. Either of the screens may be formed of similar wire.

Catalytic Elements

H. R. SUTER *et al.* *British Patent 775,550*
Discloses the manufacture of the catalyst of No. 775,549 *supra*. A base of a nickel-chromium, nickel-chromium-iron alloy or other high temperature resistant alloy is coated with a deposit of one or more of the platinum group metals and the whole is heated to 600°F in an air stream containing volatile hydrocarbons to condition the coating and increase the strength of the bond.

Production of Substituted 1,2 Diphenyl-3,5-Dioxo-Pyrazolidines

J. R. GEIGY A.G. *British Patent 775,925*
A palladium-on-charcoal catalyst is used in a process for the preparation of the above compounds.

Hydrogenative Reforming of Gasoline

HOUDRY PROCESS CORP. *British Patent 775,961*
A multi-stage process of upgrading naphthas or gasoline catalytically at reforming temperatures and super-atmospheric pressure is effected in an initial stage in the presence of a platinum-on-silica catalyst and in a subsequent stage in the presence of a platinum-on-alumina catalyst and a minor amount of gaseous halogen or gaseous halide compound mixed with the stream of hydrogen and the naphtha. The combination of alumina carrier and halogen or halide compound renders this stage more favourable for isomerisation reactions.

Forming or Restoring a Platinum-Type Catalyst

HOUDRY PROCESS CORP. *British Patent 775,962*
A catalyst consisting of a platinum group metal compound supported on alumina is treated with a reducing gas to reduce the compound to metallic form with a minor amount of vapour of a halogen or halide included in the reducing gas to control the amount of chemically bound halide in the alumina during reduction at the equilibrium value.

Reforming of Gasoline or other Naphtha Fractions

HOUDRY PROCESS CORP. *British Patent 775,963*
Reforming operations carried out in the presence of hydrogen-rich recycle gas and supported platinum catalysts, e.g. platinum-on-alumina containing a minor amount of chloride are enhanced by supplying C₂-C₄ aliphatic hydrocarbons as part of the feed.

Hydrogen Peroxide

LAPORTE CHEMICALS LTD. *British Patent 776,991*
In the manufacture of hydrogen peroxide by the successive reduction and oxidation of an organic compound, the latter is reduced in the presence of a palladium catalyst comprising palladium supported on a siliceous carrier on which an insoluble magnesium compound has first been deposited.

Hydrocarbon Reforming

STANDARD OIL CO. *British Patent 777,459*
Discloses a naphtha hydroforming process and apparatus in which a preheated mixture of a naphtha and recycled hydrogen is contacted with a first platinum catalyst at hydroforming tem-

perature and a pressure of 100-350 p.s.i.g., the stream reheated and contacted with a second platinum catalyst at higher temperature and lower pressure and then the effluent stream from this stage is reheated and contacted with a third platinum catalyst at still higher temperature and slightly lower pressure.

Catalysts

ESSO RESEARCH & ENGINEERING CO. *British Patent 777,770*

A platinum group metal catalyst of high activity is made by contacting a dilute aqueous slurry of alumina (concentration 5-25 wt %) with a dilute aqueous solution of a water-soluble compound of a platinum group metal, e.g. chloroplatinic acid in the presence of an adsorption modifier, e.g. chloroacetic acid, separating the impregnated alumina, drying and contacting it with chlorine at 600-1000°F at a chlorine partial pressure of 0.001-1 atms.

Purifying of Caprolactam

STAMICARBON N.V. *British Patent 778,751*

Caprolactam is purified by treatment with hydrogen in the presence of a platinum or palladium hydrogenation catalyst. Hydrogen is passed through an aqueous solution of the caprolactam at a temperature below the boiling point thereof.

Platinum- or Palladium-containing Catalyst

THE ATLANTIC REFINING CO. *et al. British Patent 779,497*

In preparing a hydrocarbon reforming catalyst, a cracking component—silica, and one or more of alumina, zirconia, magnesia and thoria—is contacted with an aqueous solution of a reducible compound of platinum or palladium. The cracking component has a catalytic activity of 10-50 (theoretical maximum 100). The precious metal compound is deposited in amount equal to 0.1-2.5% of the metal by weight of catalyst and contact with the cracking component is maintained for 3-288 hours under non-evaporative conditions at elevated temperature up to boiling point. The treated component is then dried and the compound reduced to the metal. The platinum or palladium deposited on the base is stated not to be removable by water washing before reduction.

Alumina

ESSO RESEARCH & ENGINEERING CO. *British Patent 779,771*

A hydroforming catalyst is made by impregnating an adsorptive alumina with catalyst material, e.g. palladium or platinum, and then calcining the alumina at a temperature of 1100-1500°F and rapidly chilling to at least room temperature; chilling time not over 50 seconds.

Regeneration of Hydroforming Catalysts

ESSO RESEARCH & ENGINEERING CO. *British Patent 780,528*

A platinum-on-alumina hydroforming catalyst contaminated with carbonaceous and sulphurous deposits is regenerated by oxidising the deposits at elevated temperatures with an oxygen-containing gas such that the gaseous products contain some, but less than 1% by volume of free oxygen.

Protecting Tube for Thermo-elements of the Platinum Group

AUGUST THYSEN-HUTTE A.G. *German Patent 959,857*

The ceramic protecting tube for platinum metal thermoelements, or at least that part subjected to the high temperature of the furnace and furnace gases, has added to it one or more platinum group metals in finely divided form and/or in the form of a surface coating.

Manufacture of Platinum Group Metal Catalysts

N.V. de BATAAFSCHE PETROLEUM MAATSCHAPPIJ *German Patent 960,894*

In the manufacture of a catalyst composed of a platinum group metal supported on silica and/or alumina containing acid carrier in which the neutralised acid carrier is contacted with a solution of a platinum group metal compound at a pH above 3, and the product dried, the medium used for neutralising the carrier is removed from the dried product.

Electrical Contacts

Dr. A. KEIL *et al. German Patent 961,762*

Claims the use of an alloy of 0.1-25% (preferably 5-15%) lead and remainder palladium as material for electrical contacts.

Electrical Contacts

W. C. HERAEUS G.M.B.H. *German Patent 965,603*
A contact material consists of 82-95% preferably 83-88% palladium, 0.5-5% aluminium, titanium, zirconium, thorium, vanadium, niobium and/or tantalum and remainder of at least 5% copper.

Catalysts

HOUDRY PROCESS CORP. *U.S. Patent 2,785,138*

Supported platinum group metal catalysts are stabilised against rapid deactivation in use by treatment in a stream of reducing gas before use. The reducing gas is composed of hydrogen containing up to 1% by volume of chloride vapour, expressed as hydrogen chloride.

Process for a Formylation of a 5-Nitrosouracil

THE NEW YORK QUININE & CHEMICAL WORKS INC. *U.S. Patent 2,785,163*

A supported platinum group metal catalyst is used in the reductive formylation of a 5-nitrosouracil derivative of specified formula.

Electric Discharge Lamp

GENERAL ELECTRIC CO. *U.S. Patent 2,785,327*
An electric discharge lamp consists of a vitreous envelope on the inner face of which is a reflecting coating composed of an inner layer of rhodium on which is a phosphor coating which is excitable to light emission by radiation from ultra-violet generating means within the envelope and contains material chemically inert to rhodium.

Tetradehydro Reserpic Acid and Esters Thereof

CIBA PHARMACEUTICAL PRODUCTS INC. *U.S. Patent 2,786,843*
Palladium black and a platinum catalyst are used in the preparation of tetradehydro compounds.

Metal Film Resistor

SPRAGUE ELECTRIC CO. *U.S. Patent 2,786,925*
A metal film resistor is composed of an electrically resistive film of a metal alloy on a vitreous base, fired on silver layers connected to the base and forming terminals and narrow bands of platinum or palladium connecting the silver layers with the resistive film in order to counteract any tendency for the silver layers to diffuse into the resistance film.

Contact Materials

THE NORTH ELECTRIC CO. *U.S. Patent 2,787,688*
An electrical contact member includes the combination of a current conducting base and a solid state alloy surface composed mainly of palladium and zinc.

Electrodes for Electron Discharge Tubes

INTERNATIONAL TELEPHONE AND TELEGRAPH CORP. *U.S. Patent 2,788,460*
A non-emissive electrode is formed of a core of tantalum, molybdenum, zirconium, columbium, tungsten or hafnium or alloys thereof, an emission-inhibiting homogeneous coating on this core composed of carbon bonded with one or more platinum group metals and an intermediate barrier layer to prevent interaction between the coating and the core.

Electrical Contact Devices

SIEMENS & HALSKE A.G. *U.S. Patent 2,789,187*
A contact piece of low electric resistance for frequent switching operation under heavy current loading is composed of a carrier on which is a surface layer contact face formed of a sintered composition comprising 20-70% gold and 80-30% iridium or rhodium.

Hydrogen Altimeter

BENDIX AVIATION CORP. *U.S. Patent 2,790,324*
An altimeter includes a hydrogen pressure responsive device having an evacuated envelope into the interior of which communicates an insert made of a platinum group metal. The insert is heated to allow the flow of hydrogen through it into and out of the envelope so as to vary the hydrogen pressure within the envelope as a function of altitude.

Fluidised Hydrocarbon Conversion Process

THE M.W. KELLOGG CO. *U.S. Patent 2,791,542*
Light hydrocarbon oils are reformed by means of a fluidised platinum catalyst by a novel method which avoids substantial loss of catalyst due to entrainment in the gaseous effluent streams of the processing zones. Method of stripping catalyst described.

Electrodes

N. de MAKAY *U.S. Patent 2,791,557*
An electrode for electrolytic processes includes a glass tube through the walls of which extend, and to which are fused, a number of platinum wires. A platinum electrode is attached to the platinum wires externally of the tube and lead-in alloy conductors extend along the interior of the tube and contact a portion of each platinum wire.

Reforming of Gasoline

SHELL DEVELOPMENT CO. *U.S. Patent 2,792,337*
A platinum catalyst is used in the hydroforming of a gasoline fraction in which the fraction is preheated in the presence of hydrogen to over 800°F and the preheated vapours are then passed via a ferruginous metal feed inlet line to a catalytic converter and through a bed of the catalyst therein.

Electrodeposition of Platinum

THE INTERNATIONAL NICKEL CO. INC. *U.S. Patent 2,792,341*
Thick smooth adherent deposits of platinum free from cracks are obtained by use of an aqueous acid chloride-chloroplatinate bath containing in solution 180-300 gm/litre of hydrogen chloride, 10-50 gm/litre of platinum and balance water.

Electrical Contact Elements

BAKER & CO. INC. *U.S. Patent 2,793,273*
The positive contact of a pair of cooperating contacts consists of an alloy of 90-99% palladium and 1-10% ruthenium, while the negative contact consists of 90-99.5% silver and 0.5-10% palladium.