

thermometers are discussed. Errors may arise in the resistance bridge, in the Pt wire of the thermometer and in the water triple point cells. The relative drift of resistance coils in Mueller resistance bridges is <1 ppm/year. The intrinsic resistance of a Pt thermometer is comparatively unstable since the wires are annealed,

and cold work and heat treatment affect their temperature coefficient. The errors arising from the cells were determined by measurements on reproducibility and long-term stability of cell temperatures. The limiting uncertainties due to variations in these three factors are each of the order of 10⁻⁴°C.

NEW PATENTS

Reactivating Spent Catalyst

ESSO RESEARCH & ENGINEERING CO. *British Patent* 760,612

A spent supported platinum or palladium hydroforming catalyst is reactivated by contacting it at elevated temperature with fluorine, chlorine or bromine or with a first substance containing halogen which is labile and with a second substance having oxidising properties under the contacting conditions. The substances are so chosen that not more than 10 wt % of the metal and not more than 20 wt % of the support is removed from the catalyst during reactivation.

Catalytic Hydrogenation

LAPORTE CHEMICALS LTD. *British Patent* 760,737

Alkylated or arylated anthraquinones in solution are reduced by hydrogen in the presence of a palladium on silica-alumina catalyst which has been prepared by impregnating the carrier with a palladium compound, by adsorption from an aqueous solution of palladium nitrate or chloride and then treating the catalyst with an aqueous alkaline solution, followed by reduction to the metal.

Catalytic Combustion of Hydrocarbons

GOGAS GOCH & CO. *British Patent* 760,796

Apparatus for flameless combustion of propane, methane or town gas comprises a catalytic mass, e.g. platinum on asbestos fibres or silica gel, arranged in a housing on a heat storage body formed by a gas-pervious ceramic or metallic plate having a minimum width greater than its thickness and a gas distributing chamber formed between the plate and the base of the housing.

Measuring Concentration of Gases

A. LIGHT *British Patent* 761,055

The presence of oxygen or hydrogen in a gas or gaseous mixture is detected by flowing a stream of the gas over a palladium catalyst and measuring any rise in temperature of the catalyst above the temperature of the gas stream flowing towards the catalyst. The catalyst may consist of finely divided palladium supported in a plate of sintered glass forming the wall of a tube through which the gas flows, a platinum resistance element being wound on the outside of the tube.

Hydroforming Catalyst

STANDARD OIL CO. *British Patent* 761,192

A hydroforming catalyst of improved activity and in which the catalyst metal is uniformly distributed throughout the carrier is prepared by impregnating solid hydrous alumina (1-30% by weight of combined water based on dry Al₂O₃), in the presence of 0.001-0.02 mole of a water soluble inorganic aluminium salt per mole of dry Al₂O₃, with a solution of a platinum compound in quantity to add 0.01-1% of platinum, drying and calcining the mixture. The aluminium salt is preferably aluminium chloride and a solution of chloroplatinic acid is used.

Production of Fully Hydrogenated Aromatic Hydrocarbons

THE COAL TAR RESEARCH ASSOCIATION *British Patent* 761,755

Polynuclear aromatic hydrocarbons and/or partially hydrogenated polynuclear aromatic hydrocarbons are passed entirely in the vapour phase at 20-100 atmospheres partial hydrogen pressure at 200-500°C over a Group VIII catalyst, e.g. metallic platinum, either alone or supported on a carrier and preferably containing promoting substances such as thoria.

Joining Metal Members to Ceramic Members

STANDARD TELEPHONES & CABLES LTD. *British Patent* 762,105

A metal member is joined to a ceramic member, e.g. a ceramic support rod in electric discharge devices, by electroplating an area of the ceramic with a metal coating and then spot welding the metal member to it. For example, a ceramic rod is painted with a colloidal suspension of platinum in oil of lavender and the rod heated to 500°C to give a very thin conducting layer. Copper is then plated on to the platinum coating, and an end cap of copper-nickel alloy is spot welded in place.

Conversion of Crude Oil

UNIVERSAL OIL PRODUCTS CO. *British Patent* 761,847

A reforming catalyst composed of alumina and 0.05-1.5% of platinum and preferably containing

0.1-2% combined fluorine is used in a process of converting crude oil into valuable hydrocarbons. The process comprises distillation, reforming all or part of the recovered gasoline that results in a net production of hydrogen, deasphalting part of the residual fraction, hydrocracking in the presence of hydrogen from the reforming step to produce gasoline.

Synthesis of Hydrocarbons

RHEINPREUSSEN A.G. FÜR BERGBAU UND CHEMIE
British Patent 762,704

Hydrocarbons and oxygen containing organic compounds are synthesised by contacting a mixture of carbon monoxide and water vapour (2 vols. of CO per vol. of water vapour) at 150-350°C with a catalyst mainly consisting of an VIIIth Group metal, e.g. ruthenium, and previously activated at 15-350°C with CO and then with hydrogen.

Synthesis of Hydrocarbons

RHEINPREUSSEN A.G. FÜR BERGBAU UND CHEMIE
British Patent 762,705

Similar subject matter to No. 762,704.

Platinum-Alumina Catalyst

ESSO RESEARCH & ENGINEERING CO. *British Patent 762,728*

The activity of a platinum-alumina catalyst is improved by inclusion of aluminium chloride. The catalyst is made by contacting an alumina with an aqueous solution containing aluminium chloride and an organic platinum-containing compound, drying to impregnate platinum and aluminium chloride on the alumina and then reducing. 0.01-2% platinum and 0.01-15% aluminium chloride, based on total weight of catalyst is preferred.

Production of Gasoline

BADISCHE ANILIN & SODA FABRIK A.G. *British Patent 762,811*

Gasoline is produced from oils by passing the initial material together with hydrogen at a pressure of more than 50 atms. and at 250-450°C over a catalyst consisting of a silicate of a metal of the 5-8th Groups. Platinum, palladium, and ruthenium may be used as the catalyst.

Apparatus for Making Glass Fibres

OWENS-CORNING FIBERGLASS CORPORATION *British Patent 763,160*

In apparatus for making glass fibres, the feeder for forming a number of streams of molten glass is composed of one or more V-section members having a number of orifices in a part made of platinum-gold alloy having a wetting angle not less than 55° for molten glass. The alloy is preferably a 97% Pt - 3% Au or 94% Pt - 6% Au alloy.

Nickel-Manganese Alloy

THE BRISTOL AEROPLANE CO. LTD. *British Patent 763,171*

A nickel-manganese alloy for use as a brazing metal in joining stainless steels or other heating resisting alloys contains 30-60 parts by weight of nickel in every 100 parts of nickel plus manganese, and 1-40% by weight of palladium. Melting point not over 1250°C 5-15% palladium used with 30-50 parts of nickel.

Reduction of Δ^4 -3-Keto-Steroids

FARMACEUTICI ITALIA S.A. *British Patent 763,301*

In the reduction of the $\Delta^4(5)$ double bond of a Δ^4 -3-keto-steroid to form isomeric 5- α - and 5- β - derivatives by catalytic hydrogenation, a palladium-carbon catalyst containing 5% palladium is used. Triethylamine is used as the promoter.

Production of Gasoline

BADISCHE ANILIN U. SODA FABRIK A.G. *British Patent 763,377*

A catalyst consisting of alumina impregnated with a platinum group metal (platinum or palladium or a compound thereof) is used in process of producing gasoline from a crude oil fraction by a multistage catalytic pressure hydrogenation in the liquid and gas phase.

Electric Reactors for Catalytic Gas Reactions

MONTECATINI SOC. GEN. PER L'INDUSTRIA MINERARIA E CHIMICA *British Patent 763,461*

A heating and catalytic body for use in endothermic gas reactions at high temperatures is composed of an electric resistor, e.g. a rod of graphite or carbon, surrounded by a protective fireproof dielectric layer, e.g. porcelain, alumina or quartz, and an outer layer of a catalytic metal, preferably platinum or other platinum group metal or alloy.

Semi-Conductor Translating Devices

STANDARD TELEPHONES & CABLES LTD. *British Patent 763,927*

A point-contact semi-conductor translating device has the whisker formed of an alloy containing 8-20% of a platinum group metal and 0.1-2% of an acceptor impurity and remainder gold. The material may comprise 8-20% platinum and 0.1-2% gallium. Rhodium or ruthenium may be used and indium instead of gallium.

Catalytic Reforming of Light Gasoline Fractions

N.V. DE BATAAFSCHE PETROLEUM MAATSCHAPPIJ *British Patent 764,389*

The octane number of a light paraffinic gasoline fraction boiling at 95-110°C is improved by separating the fraction by fractional distillation into a lower boiling and a high boiling fraction at

55–75°C, reforming the higher boiling fraction by use of a platinum-containing catalyst and blending the resulting products.

Preparation of Compounds of Fluorine and Carbon

E. I. DU PONT DE NEMOURS & CO. *British Patent 764,424*

A platinum-lined nickel tube is used for containing anhydrous mercury fluoride and carbon black in a process for the preparation of fluorocarbons.

Sparking Plug Electrode

K.L.G. SPARKING PLUGS LTD. *British Patent 764,831*

The discharge portion of a spark plug electrode is formed of a platinum group metal having a surface layer impregnated with chromium, the outermost part of the surface being substantially all chromium.

Regeneration of Platinum and Palladium Catalysts

ESSO RESEARCH & ENGINEERING CO. *British Patent 765,221*

A catalyst composed of 0.01–10% of a platinum or palladium metal supported on a refractory oxide base used during a hydrocarbon conversion reaction is reactivated by burning off the carbonaceous deposits with a gas of 2–6 vol % initial oxygen content at an initial temperature above 700°F, the burning reaction raising the temperature rapidly to not over 1100°F; the temperature is kept at around 1000°F until danger of temperature runaway is removed, the catalyst then being contacted with a gas of higher oxygen content to complete reactivation.

Electric Contacts

WESTERN ELECTRIC CO. *British Patent 765,273*

An electric contact is formed of an exposed layer or cap of an alloy of at least 50% gold and 0–5% (not more) of a platinum group metal and an unexposed layer of an alloy containing at least 50% of a platinum group metal, e.g. 50% palladium-nickel or 100% palladium. For example, in a “dry” circuit, the circuit is closed through the gold layer and in a “wet” circuit, the gold layer is worn away and the circuit operates through a palladium layer, thereby avoiding failure due to organic deposit when a “dry” circuit is used.

Isomerisation of Waxy Hydrocarbons

N.V. DE BATAAFSCHE PETROLEUM MAATSCHAPPIJ *British Patent 766,027*

A process for the catalytic isomerisation of waxy hydrocarbons includes subjecting a solid catalyst composed of platinum supported on alumina, containing chlorine or fluorine, to a conditioning treatment by heating to at least 250°C in the presence of hydrogen under increased pressure.

Hydrofining of Crude Oil Fractions

BADISCHE ANILIN u SODA FABRIK A.G. *British Patent 766,021*

A catalyst consisting of platinum, palladium or ruthenium, or mixtures thereof with an iron group metal is used in a process of desulphurising crude oils by high pressure hydrogenation.

Production of Gasoline

N.V. DE BATAAFSCHE PETROLEUM MAATSCHAPPIJ *British Patent 766,404*

A catalyst composed of platinum supported on alumina, which has been treated with hydrofluoric acid, is used in a process of platforming a straight-run naphtha to an octane number of 89.

Production of Ketones

IMPERIAL CHEMICAL INDUSTRIES LTD. *British Patent 767,409*

A solid catalyst comprising up to 10% by weight of platinum or palladium supported on gamma-alumina, alumina-silica, alumina-zirconia or thoria is used in a process of converting olefines into ketones.

Manufacture of Peroxidic Compounds

THE DISTILLERS CO. LTD. *British Patent 767,615*

A platinum oxide or palladium dioxide hydrogenation catalyst is used in a process of making saturated organic mixed tertiary and primary or tertiary and secondary peroxidic compounds by hydrogenation of a beta-gamma unsaturated peroxide of specified general formula.

Manufacture of Pyridoxin- or Riboflavin-Phospho-Metallic Compounds

P. PADULA *British Patent 767,664*

Pyridoxin or riboflavin is treated with pyrophosphoric acid and phosphoric anhydride and a salt or a hydrated oxide of an oligodynamic metal, e.g. platinum or iridium, is added in the presence of a condensation catalyst, e.g. zinc oxide.

Decomposition of Metal Salts in Production of Catalysts

OXY-CATALYST INC. *German Patent 945,504*

After impregnation or coating of a catalyst support with catalytic metal salt solution, in the manufacture of supported catalysts, the catalyst containing the combined metal salts is led through a film or spray of reducing gas, e.g. hydrogen, which is surrounded by a combustible gas formed by burning the reducing gas in the presence of the atmospheric oxygen at the edges of the spray. Applicable to the manufacture of platinum or palladium supported catalysts. The noble metal salts are decomposed rapidly and completely and at a relatively low temperature.

Electric Contacts

W. C. HERAEUS G.m.b.H. *German Patent 947,742*

A palladium-copper alloy containing 5–18%

copper and remainder palladium is used as the material for electric contacts. 10-15% copper preferred.

Treatment of Platinum Catalysts

RUHRCHEMIE A.G. *German Patent* 950,192

The length of life of platinum catalysts, wound or rolled up in disc-like form from narrow strips of platinum, when used in ammonia oxidation and like chemical processes is vastly improved if the discs are turned from time to time and/or rotated about their axes and/or freed of platinum dust or powder adhering thereto. 16,000-25,000 operating hours is stated to have been attained with this method of treatment.

Catalytic Naphtha Reforming

ESSO RESEARCH & ENGINEERING CO. *U.S. Patent* 2,765,262

Describes a continuous method of hydroforming naphthas in a system comprising a hydroforming zone and a catalyst regeneration zone, in which a platinum on active alumina catalyst is used.

Catalytic Dehydrogenation of Peperidine to Pyridine

IMPERIAL CHEMICAL INDUSTRIES LTD. *U.S. Patent* 2,765,310

A platinum or palladium catalyst is used in a process of dehydrogenation of peperidine to pyridine by passage of peperidine vapour and hydrogen thereover.

Dehydrogenation of Peperidine to Pyridine

IMPERIAL CHEMICAL INDUSTRIES LTD. *U.S. Patent* 2,765,311

Peperidine is dehydrogenated to pyridine by passing peperidine vapour and hydrogen over a platinum or palladium catalyst supported on silica gel at 200-500°C.

Dehydrochlorination Process

ETHYL CORPORATION *U.S. Patent* 2,765,350

Platinum or palladium or their oxides are used as catalyst in the manufacture of chloralkine by contacting a polychloroethane with the catalyst at 150-500°C.

Production of Methylcyclopentene

SHELL DEVELOPMENT CO. *U.S. Patent* 2,765,355

Methylcyclopentene is produced by dehydrogenating methylcyclopentane at 400-600°C with a catalyst composed of 0.05-0.5% platinum on silica gel which is free of alumina impurity.

Catalyst Manufacture

AMERICAN CYANAMID CO. *U.S. Patent* 2,768,125

A hydroforming catalyst is prepared by precipitating aluminium hydroxide gel from an alkali metal aluminat solution by reaction with a mineral acid, mixing the resulting filter cake with hydrochloric or nitric acid (0.1-1 mol of

acid per mol of Al_2O_3) to form a paste and adding 2-30% of platinum or palladium to the paste and drying.

Production of HCN

DEUTSCHE GOLD u SILBER SCHEIDEANSTALT *U.S. Patent* 2,768,876

A gaseous mixture of volatile hydrocarbons and ammonia is reacted in the presence of a platinum metal catalyst in a heated reaction chamber the walls of which are formed of 0.7-8% SiO_2 and remainder Al_2O_3 .

Removing Arsenic from a Naphtha

UNIVERSAL OIL PRODUCTS CO. *U.S. Patent* 2,769,770

Reformed gasoline is produced from an arsenic-containing hydrocarbon charge by irradiating the charge with light of wavelength 0.1-0.8 micron separating a gasoline fraction having an arsenic content of less than 0.015 part per million and reforming the fraction in the presence of a catalyst composed of alumina and platinum or other platinum group metal.

Refining a Hydrocarbon Distillate

UNIVERSAL OIL PRODUCTS CO. *U.S. Patent* 2,770,578

An unsaturated sulphur containing hydrocarbon distillate is refined by hydrogenation in the presence of a platinum or palladium catalyst at below desulphurising temperature and then by desulphurisation in presence of a catalyst containing a Group VI metal and a metal of the iron group.

Reduction of Metachloronitrobenzene

COLUMBIA-SOUTHERN CHEMICAL CORP. *U.S. Patent* 2,772,313

A metahaloaniline is prepared by treating a metahalonitrobenzene with hydrogen in the presence of a catalyst containing metallic rhodium, at 25-180°C.

Refining of Hydrocarbons

UNIVERSAL OIL PRODUCTS CO. *U.S. Patent* 2,773,011

A hydrocarbon fraction containing nitrogen compounds is purified by treatment with hydrogen at 400-850°F in the presence of a catalyst composed of alumina, platinum and an alkali metal or a compound thereof.

Hydrocarbon Reforming

STANDARD OIL CO. *U.S. Patent* 2,773,013

A platinum-on-alumina catalyst is used in a process of converting a low octane number naphtha containing more than 0.1% sulphur and rich in paraffins and naphthenes into a high octane naphtha product.

Hydrocarbon Reforming

STANDARD OIL CO. *U.S. Patent* 2,773,014

Similar subject matter to No. 2,773,013.