

Rh-Pt/30% Rh-Pt thermocouple was used and the materials selected for shield tubes were BeO, spinel, ZrO₂ and Al₂O₃. These tubes were protected by a Cr-Ni steel tube in the acidic-roofed furnace, but this was unnecessary with the basic type. The life-time of the shields in operation at a temperature of ~1700° C is as follows (in numbers of melts): BeO over 100, ZrO₂ 18-20, Al₂O₃ 18-20, spinel ~14. The life of the thermocouple was 300 melts. The best

shield material is obviously BeO although ZrO₂ and Al₂O₃ could also be used. Spinel is not suitable. A disadvantage in using Al₂O₃ is that carbon contamination (observed in all cases) leads to the formation of an Al carbide with a melting point of only 1400° C. Carbides of Zr and Be which may be formed have melting points of 3500° and 2100° C respectively. The estimated cost of temperature control by this method is less than that using optical pyrometers.

NEW PATENTS

Glutamic Acid Derivatives

INTERNATIONAL MINERALS & CHEMICAL CORP.
British Patent 786,226

A platinum, palladium or rhodium catalyst is used in the treatment of N-carboallyloxy-L-glutamine to remove the carboallyloxy group.

Preparation of Metal Gluconates

CHAS. PFIZER & CO. INC. *British Patent 786,288*

A metal gluconate is prepared by contacting an aqueous glucose solution (concentration at least 20% by weight) containing a noble metal catalyst with oxygen at not above 55°C and at a pH maintained at between 8 and 11, the pH used at any given temperature being chosen so as to minimise decomposition. The catalyst consists of palladium-on-charcoal or palladium-on-alumina.

Hydrogenation of Organic Nitro Compounds

E. I. DU PONT DE NEMOURS & CO. *British Patent 786,407*

In the catalytic hydrogenation of organic nitro compounds to the amine product with the use of a noble metal, i.e. platinum or palladium catalyst supported on an inert carrier, e.g. carbon, diatomaceous earth or silica, an increased rate of hydrogenation is obtained by mixing with the catalyst an oleophilic carbon having an oil absorption factor of at least 200.

Production of Tetracycline

AMERICAN CYANAMID CO. *British Patent 787,056*

Tetracycline is made by reacting hydrogen with chlortetracycline in the presence of a palladium hydroxide catalyst. The palladium hydroxide may be used alone or supported on a porous carrier, e.g. activated carbon or activated alumina.

Gasoline Reforming Catalyst

W. R. GRACE & CO. *British Patent 787,275*

An alumina base reforming catalyst is made by simultaneously incorporating silica and fluorine values with a porous gamma-type alumina base by impregnating the base with silicon tetrafluoride or fluosilicic acid in sufficient amount to form a final catalyst containing 0.03-3 wt.% of silica and 0.1-8 wt.% of fluorine and mixing in

an aqueous solution of a water-soluble platinum compound in sufficient amount to give 0.1-2 wt.% of platinum. The platinum compound which is preferably chloroplatinic acid is then reduced to the metal.

Removing Impurities from Platinum

UNIVERSAL OIL PRODUCTS CO. *British Patent 787,296*

An aqueous solution of an acid containing platinum as part of a complex anion and also containing a cation impurity is purified by contacting the solution with a solid cation exchange material, transferring the impurity to this material by a cation exchange reaction and separately recovering the purified solution of the platinum. The platinum may be present as chloroplatinic acid (H₂PtCl₆).

Regeneration of Catalysts

LAPORTE CHEMICALS LTD. *British Patent 787,340*

A supported palladium catalyst, after becoming deactivated in use for the manufacture of hydrogen peroxide, is reactivated by treatment with a solution of sodium hydroxide.

Catalytic Conversion of Hydrocarbons

UNIVERSAL OIL PRODUCTS CO. *British Patent 787,539*

A platinum-alumina-combined halogen catalyst (*British Patent 657,565*) or a platinum-alumina-silica catalyst containing 0.2-2 gm of platinum per 100 cc of catalyst (*U.S. Patent 2,478,916*) is used in a process for the catalytic reforming of gasoline hydrocarbons.

Platinum-Alumina Catalyst

STANDARD OIL CO. *British Patent 787,755*

An alumina-supported platinum catalyst is made by adding an alkaline substance, e.g. ammonia or a water-soluble amine to peptised alumina, e.g. an alumina hydrosol, in sufficient amount to raise the pH to 8.5 to 12, maintaining this condition for over 1 hour, separating solid hydrous alumina from the resulting slurry, drying to a volatiles content below 50% by weight wet basis,

and impregnating the dried alumina with 0.05–1% by weight of platinum based on dry Al_2O_3 .

Manufacture of Geranyl-Acetone and Dehydrogeranyl-Acetone

F. HOFFMANN-LA ROCHE & CO. A.G. *British Patent* 788,302

A lead-poisoned 5% palladium-calcium-carbonate hydrogenation catalyst is used in a process for the synthesis of hexahydro-pseudoionone.

Manufacture of a Novel Acetoacetone

F. HOFFMANN-LA ROCHE & CO. A.G. *British Patent* 788,303

A palladium-calcium carbonate catalyst (lead-inhibited) is used in the manufacture of dihydro-linalyl acetoacetate.

Preparing Aviation Fuels

N.V. DE BATAAFSCHE PETROLEUM MAATSCHAPPIJ *British Patent* 788,571

A mixture of liquid hydrocarbons for use as aviation fuel is prepared by separating a fraction of initial boiling point of 65–85°C and a final boiling point of 130–140°C from a naphthenic straight-run gasoline, catalytically reforming, i.e. with a platinum-containing catalyst, the fraction and removing from the resulting reformate an intermediate fraction of initial boiling point of 85°C and a final boiling point of 105°C. See also No. 788,572 for similar subject matter.

Monoalkylaminoalkyl Esters of Substituted Benzoic Acids

ABBOTT LABORATORIES INC. *British Patent* 788,585

A palladium-on-charcoal catalyst is used at one stage in the preparation of the above esters.

Hydroisomerisation Process

GULF RESEARCH & DEVELOPMENT CO. *British Patent* 788,588

A hydroisomerisation process, i.e. for converting *n*-pentane and *n*-hexane to branched-chain isomers, in the presence of hydrogen, consists in contacting a hydrocarbon charge of the gasoline boiling range, in admixture with hydrogen, with a supported platinum catalyst at 315–540°C, a pressure of 1.4–140 kg. per sq. cm. gauge and a charge liquid hourly space velocity of at least 5 vols. of hydrocarbon per vol. of catalyst per hour, whilst maintaining a ratio of hydrogen to hydrocarbon in the charge from 1.4–28 standard cubic metres of hydrogen per barrel of hydrocarbon. A 0.2–1% platinum-alumina catalyst is used.

Preparation of Saturated Carbinols

AIR REDUCTION CO. INC. *British Patent* 788,969

The selective hydrogenation and hydrogenolysis of a symmetrical aliphatic ditertiary acetylenic glycol is effected by subjecting the glycol to the

action of hydrogen in the presence of a palladium on charcoal catalyst and in a solvent reaction medium composed of isopropyl alcohol, *n*-butyl alcohol, *tert*-butyl alcohol or mixtures of any two of them.

Heterocyclic Compounds

MERCK & CO. INC. *British Patent* 789,484

5-(δ -chlorobutylidene) hydantoin is brought into intimate contact with hydrogen in the presence of a hydrogenation catalyst to produce 5-(δ -chlorobutyl) hydantoin. The catalyst may be platinum oxide.

Upgrading of Cracked Naphthas

CALIFORNIA RESEARCH CORP. *British Patent* 789,679

A cracked naphtha is first distilled and the two fractions hydrogenated in the presence of a catalyst (or hydrogenated and then distilled) and then the hydrogenated cracked naphtha fractions are separately contacted with a platinum catalyst (0.1–1% platinum-on-alumina or silica-alumina) under dehydrogenating conditions severe enough in each case to produce liquid product having a F-I clear octane rating above 80.

Hydrogen-Treating Catalytic Naphthas

ESSO RESEARCH & ENGINEERING CO. *British Patent* 789,847

Hydrocarbon naphtha fractions of improved octane number are produced by separating a fraction boiling at 65–115°F from a catalytically cracked naphtha and hydrogen-treating, e.g. hydrogenating, the fraction to an extent such that at least 30% of the olefins present in the fraction are saturated. Platinum on alumina catalyst is referred to.

Catalytic Pressure Refining of Crude Gasoline etc.

BADISCHE ANILIN & SODA FABRIK A.G. *British Patent* 789,988

Hydrogenation catalysts consisting of platinum, palladium or ruthenium are used in a process for the catalytic pressure refining of crude benzene, crude gasoline, crude kerosene or crude gas oil with 0.2–2.5 cubic metres of a hydrogen-containing carbon monoxide at a hydrogen partial pressure of 10–60 atmospheres, a throughput of 0.3–2.5 kg. of crude product per litre of catalyst per hour and an admission temperature of 280–450°C into the reaction zone.

Coating of Metals Electrolytically with a Layer of Platinum

N.V. PHILIPS GLOEILAMPENFABRIEKEN *Belgian Patent* 551,868

An article to be coated is placed in an electrolytic bath consisting of a solution of chloroplatinic acid and chloride of mercury ($HgCl_2$).

Treatment of Gaseous Mixtures

THE DOW CHEMICAL CO. *Belgian Patent* 553,873
Acetylene contained in a gaseous mixture of ethylene and acetylene is hydrogenated by contacting the gas with hydrogen in the presence of a catalyst composed of 60-99 parts by weight of palladium and 40 parts to 1 part of copper, silver or gold.

Use of Palladium Alloy for Spinning Nozzles

W. C. HERAEUS G.m.b.H. *German Patent* 1,010,742
An alloy of 15-30% iridium and remainder palladium is used for making spinning nozzles for the production of artificial threads, e.g. artificial silk, 20-30% of iridium is preferred. Up to 15%, but preferably less than 5%, of the palladium may be replaced by another platinum group metal.

Preparation of Acid-Addition Quaternary Salts

OLIN MATHIESON CHEMICAL CORP. *U.S. Patent* 2,813,904

A catalyst composed of palladium black, palladium-charcoal, rhodium-charcoal or palladium-barium sulphate is used in the preparation of acid-addition quaternary salts by hydrogenation, at superatmospheric pressure, of a diquaternary ammonium compound of stated general formula.

Catalysts

THE M.W. KELLOGG CO. *U.S. Patent* 2,814,599

A catalyst is composed of 0.01-5% by weight of platinum or palladium in combination with 0.05-20% by weight, based on the total catalyst, of a compound of a Group III metal of atomic number at least 21 and not over 89, supported on an inorganic metal oxide not reducible below 1200°F.

Brazing Alloy

THE INTERNATIONAL NICKEL CO. INC. *U.S. Patent* 2,815,282

An alloy for soldering heat-resistant chromium-containing alloys for high temperature service of about 550-850°C is composed of 28-67% nickel, 16-40% manganese and balance of 56-10% palladium. The alloy has a melting temperature of not less than 1050°C and not more than 1250°C.

Electrical Contacts

METALS AND CONTROLS CORP. *U.S. Patent* 2,815,421

One contact element of a pair of co-operating contacts is formed of an alloy consisting of 60-80% by weight palladium, 0.5-1.8% nickel, cobalt or copper or mixtures thereof and remainder silver. The other contact element consists of an alloy of 50-80% gold by weight and remainder silver.

Fluid Hydroforming Process

ESSO RESEARCH & ENGINEERING CO. *U.S. Patent* 2,816,857

Describes a method of hydroforming hydrocarbon oils boiling in the naphtha boiling range with the aid of a fluidised bed of a platinum-containing catalyst, which is continuously regenerated.

Conversion of Hydrocarbons

THE M.W. KELLOGG CO. *U.S. Patent* 2,817,690

In a process for pyrolysing hydrocarbons in which the hydrocarbons and oxygen are passed at a linear velocity exceeding the flame propagation velocity through a conversion zone under conditions suitable to effect flame partial combustion and conversion of the hydrocarbons, the combustion flame is maintained by contacting the reactants with a flame stabilising material, which may be platinum or palladium.

Catalyst

THE M.W. KELLOGG CO. *U.S. Patent* 2,818,393

A catalyst is made by combining an ammine complex of platinum or palladium, a mercury compound as an activator and a carrier material and treating the mixture to decompose the ammine complex to the metal.

Preparation of Platinum-Containing Catalysts

UNIVERSAL OIL PRODUCTS CO. *U.S. Patent* 2,818,394

A refractory inorganic oxide support is impregnated with platinum-containing solution in a series of stages. After each of a number of such stages, the impregnated support is heated first in an oxidising atmosphere and then in a reducing atmosphere at from 500°F to about 1100°F.

Electrical Resistance Wires

SECON METALS CORP. *U.S. Patent* 2,819,162

An electrical resistance wire is composed of an alloy of 54-60 parts of platinum, 34-40 parts of palladium and 5-8 parts of molybdenum or of a mixture of molybdenum and tungsten (not over 25% tungsten).

Catalyst Carrier

A. GOTTWALD *U.S. Patent* 2,821,510

A support or carrier for a platinum catalyst is made by impregnating and coating a combustible cellulose fibre textile fabric with a solution of waterglass, drying and immersing it in a dilute aqueous solution of a mineral acid long enough to convert the waterglass into silicic acid with a salt. The fabric is then washed and dried at not over 200°C ignited in air and the residue heated in an oxygen atmosphere to 1200-2000°F to cause any carbon in the residue to combine with the silicic acid and with oxygen. The residue is then treated with platinum or platinum black.