

contact angle for Fe was temperature dependent even at  $10^{-3}$ mm. The different behaviour on these metal surfaces is related to their affinity for oxygen, which is least for Au and greatest for Fe. The increase in wetting of Pt between  $10^{-3}$ mm and atmospheric pressure was ascribed to a change in the glass-metal interfacial energies at the metal-glass-vapour junction.

#### **The Development and Use of Glass Fibres**

A. HUDSON DAVIES, *J. Roy. Soc. Arts*, 1957, **60**, (Apr.), 437-452 (Reprinted in *Glass*, 1957, **34**, (9), 403-410)

The manufacture, properties and uses of glass wool and continuous yarn are described. The molten glass is run into platinum bushings

provided with accurately formed tips to deliver the fibre. In making glass wool a blast of superheated steam breaks up the glass stream into individual fibres. In continuous filament yarn manufacture the glass thread is drawn through the forming tips at a constant speed and is then treated as a normal textile yarn. The temperature of the platinum bushings must be accurately controlled since this determines the temperature and hence the viscosity of the glass. Glass wool is used as an insulator in aircraft and buildings and in the protection of oil-pipe lines. Glass yarn has wide application as an insulator in the electrical industry but the most important future use is expected to be in glass-reinforced plastics for the aircraft, motor and shipbuilding industries.

## **NEW PATENTS**

#### **Manufacture of Amines**

SOC. INDUSTRIELLE DES DERIVES DE L'ACETYLENE  
*British Patent 781,230*

A platinum or palladium catalyst is used as a hydrogen transfer catalyst in the preparation of a primary  $C_1$  to  $C_8$  amine by reacting a primary or secondary  $C_1$  to  $C_8$  alcohol with ammonia at elevated temperature.

#### **Cigarette Paper and Tobacco Products Made Therewith**

J. DURANDEAUX *British Patent 781,539*

A tobacco smoking product, e.g. a cigarette is provided with an intermediary layer between the tobacco and the paper wrapping of a salt of a platinum group metal which acts catalytically to neutralise the products of combustion. The paper may be impregnated or coated with palladium chloride.

#### **Preparation of Carbon-substituted Piperazines**

WYANDOTTE CHEMICALS CORP. *British Patent 781,701*

A platinum or palladium hydrogenation/dehydrogenation catalyst may be used in the preparation of carbon-substituted piperazines by contacting an amino alcohol of given general formula with the catalyst at elevated temperature in the presence of water.

#### **Manufacture of Unsaturated Compounds**

F. HOFFMANN-LA ROCHE & CO. A.G. *British Patent 782,316*

A lead-poisoned palladium catalyst is used as a hydrogenation catalyst in a process of manufacturing all-*trans*-DL- $\alpha$ -carotene.

#### **Complex Hydroxides**

THE ATLANTIC REFINING CO. *British Patent 782,465*  
Platinum or palladium complex amine hydroxides

in which the metal is in the complex ammine cation in aqueous solution are produced by passing an aqueous solution of the corresponding platinum or palladium salt over an anion exchange resin, the latter being in the hydroxyl cycle. Platinic (palladic) or platinum (palladous) ammine hydroxides may be produced by using the corresponding platinic or platinum ammine salt.

#### **Increasing the Activity of Platinum-metal Catalysts**

N. V. DE BATAAFSCHE PETROLEUM MAATSCHAPPIJ  
*British Patent 782,787*

The activity of a platinum metal-alumina catalyst is increased by contacting the catalyst at 250-550°C with a mixture of steam, oxygen and hydrogen chloride and/or hydrogen fluoride, the steam being present in a molar concentration at least fifty times that of the hydrogen halide. The treatment is continued until the catalyst has a desired halogen content. Chlorine and/or fluorine may be initially contained in the catalyst.

#### **Catalysts**

LAPORTE CHEMICALS LTD. *British Patent 783,590*

Hydrogen peroxide is decomposed by contacting a concentrated solution thereof with ruthenium or a compound of ruthenium, the latter being in the anionic or cationic state. Examples are given of the use of ruthenium sponge, ruthenium chloride solution, ruthenium metal on alumina and ruthenium black plated on nickel. The catalytic activity is stated to be far greater than any other of the platinum metals.

#### **Manufacture of Hydrogen Peroxide**

LAPORTE CHEMICALS LTD. *British Patent 783,708*

In a cyclic process for the manufacture of hydrogen peroxide by the alternate hydrogenation and auto-oxidation of phenazine or an alkyl substituted phenazine, the catalyst used in the

hydrogenation stage is a supported palladium catalyst, e.g. 0.1-10% palladium supported on alumina, silica, magnesia, or silica-alumina carrier.

### Dehydrochlorination Process

ETHYL CORP. *British Patent* 783,841

Vinyl chloride or vinylidene chloride is made by contacting 1,1-dichloroethane or 1,1,1-trichloroethane at 150-500°C with salts or oxides of platinum or palladium. The catalyst may be supported on activated alumina. The use of platinumic acid, platinum pyrophosphate, platinum sulphate, platinumous chloride or iodide, palladium chloride or fluoride, palladium dioxide and palladium phosphate is referred to.

### Manufacture of Hexahydrobenzylamine

J. R. GEIGY A.G. *British Patent* 785,108

Hexahydrobenzylamine is made by catalytically hydrogenating tetrahydrobenzoxonitrile in the presence of acetic acid anhydride. A palladium or platinum hydrogenation catalyst may be used.

### Catalysts

THE ATLANTIC REFINING CO. *British Patent* 785,132

A platinum-containing catalyst is made by impregnating an acidic metal oxide component, e.g. silica-alumina, with an aqueous solution of platinumous tetramminohydroxide, drying and converting to metallic platinum. 0.1-2.5% by weight of platinum is present in the final catalyst. Intended for use in reforming petroleum distillate fractions.

### Hydrogenated Spiramycins

SOC. DES USINES CHIMIQUES RHONE-POULENC  
*British Patent* 785,191

An antibiotic substance is made by catalytically hydrogenating spiramycin until at most four carbon atoms have been absorbed per molecule of starting material. The catalyst employed is platinum or palladium, preferably deposited on a support of alumina, carbon or barium sulphate. Numerous examples are given.

### Titanium and Zirconium Alloys

WESTERN ELECTRIC CO. *British Patent* 785,278

An alloy is composed of titanium and/or zirconium with 4 atom per cent to 7 atom per cent of osmium. The alloys retain the body-centred cubic, or beta, structure, even when cooled below room temperature, yet their ductility and malleability is similar to elemental titanium or zirconium.

### Indirect Heating of a Fluid

COMBUSTION ENGINEERING INC. *British Patent* 785,398

A method of indirectly heating a fluid by flowing it through a conduit immersed in a fluidised bed of solid particles thereby heating the fluid

and absorbing heat from the bed includes the step of completely oxidising a fuel-air mixture catalytically within the bed, the latter being composed at least partly of an active oxidation catalyst. Contact of the fuel-air mixture with the catalyst causes release of heat within the bed, the temperature of which is maintained well below ordinary flame temperature. Platinum group metal catalysts are used, platinum on activated alumina being specifically mentioned.

### Catalyst for Gas Phase Oxidation Reactions

E. I. DU PONT DE NEMOURS & CO. *British Patent* 785,657

A catalyst for gas phase oxidation reactions, e.g. the synthesis of hydrogen cyanide from ammonia, is formed of a gauze of platinum or of an alloy containing at least 50% platinum, superposed on a layer of granular refractory material, e.g. beryl, silica, porcelain or alumina, coated with platinum or an alloy containing at least 50% platinum. An alloy of 80-90% platinum and 20-10% rhodium is preferred. The reaction is carried out by passing a gaseous mixture downwards first through a layer of the gauze and then through the coated refractory.

### Contact Body for Carrying-out Catalytic Reactions

OXY-CATALYST INC. *German Patent* 1,003,192

A contact body for carrying out catalytic reactions is formed of an electrical resistance wire having thereon a thin adherent coating of a catalytically active inorganic oxide consisting of aluminium oxide, beryllium oxide, zirconium oxide, thorium oxide or mixtures thereof which has a porous structure, a thickness of less than 0.076 mm (preferably 0.0076-0.0254 mm) and is impregnated with finely divided platinum, ruthenium or palladium or mixtures thereof.

### Treatment of Platinum Catalysts

RUHRCHEMIE A.G. *German Patent* 1,003,696

In order to avoid the disadvantages formerly associated with the use of platinum catalysts, wound in form of a disc from narrow platinum strip, in processes such as the oxidation of ammonia, the outer edge of the platinum disc is tightly forced into contact with the preferably conical inner surface of an acid and/or heat resistant frame or casing. The gases to be catalysed are led directly from above downwardly through the catalyst disc by means of a hood or dome to the top of which the gases are introduced.

### Compound Metal Stock

BAKER & CO. INC. *U.S. Patent* 2,793,423

A compound metal consists of a base metal backing carrying a layer of a palladium alloy composed of 1-5% cobalt and remainder palladium.

### Reduction of Steroid Peroxides

CHAS. PFIZER & CO. INC. *U.S. Patent 2,794,033*

An 8,9-unsaturated 11,14-peroxide steroid of the ergosterol type is selectively reduced to an 8-9-unsaturated 11,14-dihydroxylated steroid by hydrogenating the peroxide in the presence of a catalyst of poisoned palladium.

### Supported Catalyst

UNIVERSAL OIL PRODUCTS CO. *U.S. Patent 2,798,051*

A supported catalyst is made by successively treating a solid adsorptive support with vaporous platinum carbonyl chloride and water vapour, adsorbing one of the gases on the surface of the support and then reacting it with the other gas to deposit platinum metal on the support.

### Production of Hydroxyl Ammonium Sulphate

BADISCHE ANILIN & SODA FABRIK A.G. *U.S. Patent 2,798,791*

In the production of a hydroxyl ammonium sulphate by reduction of nitric oxide with hydrogen on a platinum-containing catalyst in dilute sulphuric acid, the sulphuric acid is pre-oxidised by the addition of an oxidising agent in sufficient amount to increase the life of the catalyst.

### Obtaining Concentrated Aromatic Hydrocarbons

UNIVERSAL OIL PRODUCTS CO. *U.S. Patent 2,799,627*

A mixture of aromatic and unsaturated hydrocarbons is treated with a catalyst comprising platinum, alumina and combined halogen at 300–600°F at a pressure of 100–1000 p.s.i. in the presence of hydrogen. All the unsaturated hydrocarbons are hydrogenated at this temperature.

### Purifying of Acrylonitrile

MONTECATINI SOC. GEN. PER L'INDUSTRIA MINERARIA E CHIMICA *U.S. Patent 2,799,630*

A platinum or palladium catalyst is used in a process of removing acetylene hydrocarbon impurities from acrylonitrile by contacting the latter at room temperature for 30–60 minutes with hydrogen in the presence of the catalyst.

### Pretreating-Hydroforming Process

STANDARD OIL CO. *U.S. Patent 2,800,428*

Refers to the treatment of a naphtha containing more than 0.02 wt. per cent of sulphur in which part of the naphtha is desulphurised by contact with a desulphurising catalyst in a zone at 600–800°F to convert its sulphur content to H<sub>2</sub>S, which is removed from the desulphurisation zone effluent and part of the effluent is charged to a hydroforming operation comprising contact with platinum-on-alumina catalyst in three or more heating-reaction stages at pressures of 200–500 p.s.i.g. and temperatures of 850–950°F in the presence of recycled hydrogen.

### Catalysts

E. I. DU PONT DE NEMOURS & CO. *U.S. Patent 2,802,794*

In making a catalyst by impregnating activated alumina with a platinum group metal compound with subsequent reduction to the metal, the activated alumina, before impregnation, is treated with an aqueous solution of an oxidising agent at a temperature between the freezing point and the boiling point of the solution and then freed from the solution. The oxidising agent is an alkali metal or alkaline earth metal hypochlorite or hypobromite.

### Hydrogenation of Acetylene in Ethylene

THE DOW CHEMICAL CO. *U.S. Patent 2,802,889*

A catalyst for promoting the selective hydrogenation of acetylene in contact with a gas mixture of acetylene, ethylene and hydrogen is composed of an inactive carrier and not over 5% of a composition consisting of 60–99 parts of weight of palladium and 40–1 parts by weight of copper, silver or gold.

### Thermocouple

DEUTSCHE GOLD-UND SILBER-SCHNEIDANSTALT *U.S. Patent 2,802,894*

One element of a thermocouple consists of pure iridium or an iridium-rhenium alloy containing at least 90% iridium; the other element consists of an iridium-rhenium alloy containing up to 60% iridium.

### Resistance Thermometer

DEUTSCHE GOLD-UND SILBER-SCHNEIDANSTALT *U.S. Patent 2,802,925*

A resistance thermometer is composed of a measuring winding of a relatively thin extended platinum resistance element wound on a refractory support. The element has a coarse crystalline structure in which the size of the individual crystals in the direction of the thinnest dimension of the element is equal to the thinnest dimension and in a direction transverse to the thinnest dimension of the element is also equal to the thinnest dimension. The winding is covered with a hot coalesced mixture composed of 5–50 mol % beryllium oxide, 10–4 mol % calcium oxide, 3–30 mol % aluminium oxide and 5–25 mol % magnesium oxide and two or more of zirconium oxide, barium oxide, boron trioxide and silicon dioxide.

### Brazing Alloy

STEWART-WARNER CORP. *U.S. Patent 2,805,115*

A brazing alloy consists of 88–97% silver, a total of 2–10% of platinum and/or palladium and 0.1–1% of nickel, cobalt or mixtures thereof. Up to 0.5% of lithium may be included to improve the flow and wetting characteristics.