ELECTRONICS AND TELECOMMUNICATIONS

The Solion Integrator

L. WILSON, *Elect. Manufacturing*, 1960, **65**, (1), 156

The design and operating principles of this precision electrochemical cell are described. Housed in glass, it contains four small Pt electrodes and a KI/I_2 solution. The integrator anode and cathode constitute the covers of a small cylindrical volume for storing electrical information in the form of ions. The integrator may be stored for many years and produces 1 to several thousand μ amp as a true-time integrated function of an electrical input.

NEW PATENTS

Measurement of Dissolved Oxygen

CAMBRIDGE INSTRUMENT CO. LTD. *British Patent* 818,732

The invention concerns apparatus for the measurement of dissolved oxygen in a liquid which includes a scrubbing tower in which a gaseous stream, inert with oxygen gas, is contacted with an oxygen-containing liquid, the oxygen being absorbed by the stream, and an electrochemical cell for measuring the concentration of the oxygen. The cell contains an anode comprising platinum wire coated with platinum black. A small furnace containing a palladised asbestos catalyst may be used for checking the zero of the apparatus.

Production of Methylol Aminoalkanes

DEUTSCHE GOLD-UND SILBER-SCHEIDEANSTALT. *British Patent* 818,764

A hydrogenation catalyst comprising activated nickel together with a platinum group metal is used in a process for production of methylol aminoalkanes by reacting a nitroalkane with formaldehyde in an alkaline medium and hydrogenating the methylol nitroalkane formed with hydrogen.

Production of Saturated Chlorohydrocarbons

BADISCHE ANILIN & SODA FABRIK A.G. *British Patent* 819,420

A catalyst composed of a platinum group metal or compound thereof is used in a process for producing saturated chlorinated hydrocarbons from olefinic, cyclo-olefinic or alkenyl-aromatic hydrocarbons by adding on chlorine to these substances in the presence of the catalyst at temperatures up to 300°C. Palladium chloride on alumina is the preferred catalyst.

Reaction of Silanic Hydrogen-bonded Compounds with Unsaturated Compounds

UNION CARBIDE CORP. *British Patent* 822,830

A catalyst composed of platinum on a support of 99.99% gamma alumina is used in a process for producing organo-silicon compounds by reacting at elevated temperature and pressure and in the presence of the catalyst an unsaturated organic compound with a silane of given general formula.

High Temperature Measuring Apparatus

DEUTSCHE GOLD-UND SILBER-SCHEIDEANSTALT. *British Patent* 822,916

Apparatus for measuring high temperatures, e.g. 1500°–2000°C includes a thermocouple, one limb of which consists of iridium or tungsten or molybdenum and the other limb of an iridium-rhenium alloy, a housing of gas-impermeable non-metallic temperature-resisting material surrounding the thermocouple. The first limb may, if desired, also consist of an iridium-rhenium alloy.

Catalyst Manufacture

UNIVERSAL OIL PRODUCTS CO. *British Patent* 822,998

A catalyst is made by vaporising aluminium chloride or bromide on to a prepared composite of a refractory oxide and a platinum group metal, preferably platinum, with subsequent heating at above 300°C until substantially all uncombined chloride or bromide has been removed.

Catalytic Cracking of Methyl Isopropenyl Ketone Dimer

THE DOW CHEMICAL CO. *British Patent* 822,999

A platinum group metal, preferably palladium, catalyst is used in a process for converting methyl isopropenyl ketone dimer to methyl isopropenyl ketone monomer by heating the dimer at 196°–600°C in the presence of the catalyst.

Isomerisation of Hydrocarbons

UNIVERSAL OIL PRODUCTS CO. *British Patent* 823,010

An isomerisable hydrocarbon is subjected to the isomerising action of a catalyst composed of alumina, 2–5% by wt. combined fluorine, less than 0.075% by wt. chlorine and from 0.01–2.0% by wt. of a platinum group metal, preferably platinum. Numerous examples are given.

Reforming of Petroleum Naphthas

ESSO RESEARCH & ENGINEERING CO. *British Patent* 823,320

A component for gasoline blends is prepared by catalytically reforming a naphtha in the presence of hydrogen and a platinum catalyst at 100–300

p.s.i.g. to cause aromatisation, separating from the products a heavy fraction, boiling above 230°F, which fraction is then catalytically reformed using a platinum catalyst at 300–800 p.s.i.g. to cause dealkylation. A 0.2–2 wt.% platinum on alcoholate alumina catalyst is preferred.

Reforming Catalyst

THE ATLANTIC REFINING CO. *British Patent* 823,324

A hydrocarbon-reforming catalyst is composed of pelleted or extruded masses each in the form of a mixture of finely divided particles of a sorbent carrier, e.g. silica-alumina or barium sulphate, on which is deposited 0.1–20% by wt. of platinum or palladium, and particles of a silica alumina cracking component (7–30% by wt. alumina). The sorbent carrier comprises 5–75% by wt. of the catalyst.

Contact Catalyst for Oxidation of NH_3 to NO

STAMICARBON N.V. *British Patent* 824,479

In an Ostwald converter comprising two concentric tubes, the inner of which is provided with a pad of crinkled and uncrinkled platinum strips coiled face to face, the pad is arranged over a stack of two or more platinum gauzes, the meshes of which are smaller than the cross-sections of the tubular channels in the pad.

New Unsaturated Esters

F. HOFFMAN-LA ROCHE & CO. A.G. *British Patent* 824,514

A palladium-calcium carbonate catalyst, partially deactivated by treatment with a lead salt is used in a process for the manufacture of novel esters of given general formula.

Reforming of Hydrocarbon Oils

"SHELL" RESEARCH LTD. *British Patent* 824,636

Hydrocarbon oil fractions having an initial boiling point of not over 105°C and a final boiling point of 128°–140°C and containing not over 25% by wt. of naphthenic hydrocarbons are reformed at at least 400°C and 20 atm pressure in the presence of hydrogen and of a catalyst composed of at least 0.5% by wt. of a platinum metal on a carrier, e.g. alumina, having acidic properties resulting from the presence of at least 0.1% of halogen, e.g. chlorine.

Manufacture of Grid Electrodes

ENGLISH ELECTRIC VALVE CO. LTD. *British Patent* 825,028

A grid or mesh electrode for television cameras is made by coating the surface of an insulating support, e.g. glass, with palladium, placing a grid or mesh structure of nickel over the coated surface and sputtering off metal through the apertures in the structure to remove the metal coating opposite these apertures.

Platinum Apparatus

DEUTSCHE GOLD-UND SILBER-SCHEIDEANSTALT. *British Patent* 825,079

Shaped platinum apparatus required to be dimensionally stable at high temperatures is made of an alloy of 92–97% Pt and 8–3% Au. 94–96% Pt and 6–4% Au is the preferred composition.

Production of Hydrocyanic Acid and Hydrogen

DEUTSCHE GOLD-UND SILBER-SCHEIDEANSTALT. *British Patent* 825,762

The catalytic production of hydrocyanic acid and hydrogen from ammonia and a volatile hydrocarbon can be effected with high gas loads and throughput yields after short starting periods less than $\frac{1}{10}$th of those normally necessary if there is used as catalyst not only the usual platinum group metal or metals, but additionally one or more of magnesium and metals of the 3rd Group of the Periodic System, i.e. aluminium, scandium, yttrium and lanthanum, preferably in the form of the nitride.

Separation of Hydrogen from Mixtures Containing Hydrogen

JOHNSON, MATTHEY & CO. LIMITED. *British Patent* 825,973

In the separation of hydrogen from gaseous mixtures by the use of a palladium diffusion membrane or tube through which pure hydrogen diffuses and thus separates from the other constituents of the gas mixture, the gas mixture is maintained in continuous movement or circulation over the palladium membrane or tube, whereby a constant degree of permeability is maintained.

Production of High Molecular Weight Polyethylene

K. ZIEGLER. *British Patent* 826,638

A high molecular weight polyethylene for use as a plastic is made by polymerising ethylene in the presence of a catalyst composed of a reaction product of an organic compound of a metal of Groups I-III of the Periodic System of given general formula with an ionic compound of a Group VIII metal, e.g. platinum or palladium, under conditions in which oxygen and water are excluded and the ionic compound is not reduced to the free metal.

Catalyst

K. ZIEGLER. *British Patent* 826,639

Covers the catalyst of No. 826,638 *per se*.

Natriuetic Agents

MERCK & CO. INC. *British Patent* 826,921

A palladium-on-charcoal hydrogenation catalyst is used in the preparation of novel benzothiadiazine-1-1-dioxide compounds.

Sulphonamides

MERCK & CO. INC. *British Patent* 826,924

A palladium-on-charcoal hydrogenation catalyst is used in the preparation of a substituted disulphamoyl aniline compound of given general formula having diuretic properties.

Preparation of Diethyl-ketone

ESSO RESEARCH & ENGINEERING CO. *British Patent* 827,396

Diethyl-ketone is made by reacting ethylene, carbon monoxide and a hydrogen donor at 100°–300°C and a pressure of 1500–5000 p.s.i.g. in the presence of a rhodium-containing catalyst capable of being dissolved in the reaction mixture under the reaction conditions. The catalyst may be rhodium sesquioxide, alone or supported on any conventional carrier material.

Separation of Hydrogen from Gaseous Mixtures

JOHNSON, MATTHEY & CO. LIMITED. *British Patent* 827,681

In order to prevent cracking or distortion of the palladium membrane or tube of a palladium hydrogen diffusion unit in use, the membrane or tube is heated to a temperature above the transformation temperature of the palladium-hydrogen system from the alpha to the beta phase and is not allowed to fall to, or below, the transformation temperature, preferably even when the unit is not in operation.

Platinum-containing Catalysts

N.V. DE BATAAFSCHE PETROLEUM MAATSCHAPPIJ. *British Patent* 827,705

A platinum-alumina catalyst is made by peptising a hydrogel (mainly hydrated alumina) by acidifying it to a pH of 5.5–7 with a dilute aqueous solution of one or more hydrohalic acids and/or nitric acid, mixing the treated hydrogel with a platinum-containing solution, treating the product with hydrogen sulphide to form platinum sulphide, drying and calcining.

Reactivation of Platinum Catalysts

STANDARD OIL CO. *U.S. Patent* 2,910,429

A petroleum naphtha is contacted under hydroforming conditions with a platinum-alumina catalyst, and when the latter has become deactivated, it is withdrawn and reactivated at 350°–1050°F with a vapour steam comprising a volatile aluminium halide for 0.25–12 hr. to deposit 0.1–3% by wt. of the halide.

Catalyst

PHILLIPS PETROLEUM CO. *U.S. Patent* 2,911,357

In the catalytic conversion of hydrocarbons with a supported Pt, Pd or Rh catalyst, the metal is stabilised by incorporating in the catalyst Co, Ru, Ir to form an alloy so as to retard crystallisation of the metal.

Platinum Catalysts

STANDARD OIL CO. *U.S. Patent* 2,911,375

A platinum-on-alumina catalyst is prepared by forming an alumina hydrosol by treating aluminium metal with dilute acid in the presence of catalytic amounts of mercury, mixing a platinum compound with the hydrosol, drying and calcining the product, which is then activated with hydrogen.

Production of Benzene

UNIVERSAL OIL PRODUCTS CO. *U.S. Patent* 2,911,451

Benzene is prepared by treating a cycloparaffin (6 carbon atoms per molecule and at least 5 carbon atoms in the ring) with hydrogen and a non-siliceous catalyst composed of platinum-halogen and alumina, the catalyst having a surface area of 75–150 sq. m/g.

Hydrocarbon Conversion Process

THE M.W. KELLOGG CO. *U.S. Patent* 2,914,464

A naphtha fraction is reformed by contacting it with a catalyst composed of platinum and palladium combined with 0.1–10% of gallium oxide supported on alumina at 875°–950°F, a weight space velocity of 0.25–5, a total pressure of 100–750 p.s.i.g. and in the presence of 0.5–20 mols of hydrogen per mol of naphtha.

Catalysts

ENGELHARD INDUSTRIES INC. *U.S. Patent* 2,914,485

A platinum-alumina catalyst is made by incorporating a platinum sulphide sol, formed by reaction of a halogen platinic acid with hydrogen sulphide and aged for about 15 min to 2 hr, with an aqueous alumina hydrate slurry (predominantly alumina monohydrate) in such quantity that the platinum comprises 0.1–20% by wt. of the final catalyst, drying and calcining.

Palladium Plating

THE INTERNATIONAL NICKEL CO. INC. *U.S. Patent* 2,915,406

A palladium plating bath comprises a single phase, water-containing liquid containing in solution 0.001–0.25 mole/l of divalent palladium, 0.002–0.05 mole/l of hydrazine, 0.005–0.25 mole/l of a stabilising agent (aliphatic ketone, ammonium salt of a mono- or a di-basic mineral acid, or the disodium salt of ethylenediaminetetraacetic acid), 2.5–14 moles/l of ammonia or an aliphatic organic compound containing a primary amine group and balance water (at least 2 moles/l).

Process of Preparing Indans

SINCLAIR REFINING CO. *U.S. Patent* 2,916,529

In a process for the production of indans, an o-ethyl-methyl benzene is subjected to dehydrocyclisation conditions in the presence of hydrogen, a platinum group metal hydrogenation-dehydrogenation catalyst and a small amount of ammonia.