

1200°C is described. The thermoelectric characteristics of Pt:10% Rh-Pt, W: Mo, W: graphite, and W:SiC thermocouples are discussed. For temperatures up to 1650°C, a Pt:10% Rh-Pt thermocouple is recommended.

The Continuous Thermo-electric Measurement of Temperature during Steel-making by Pneumatic Processes

W. A. FISCHER, *Stahl u. Eisen*, 1962, 82, (13), 797-808

Steel temperatures up to 1625°C were measured

continuously by sheathed 6% Rh-Pt: 30% Rh-Pt thermocouples inserted through the linings of an experimental 300 kg converter, a 15-ton Thomas converter, and an 18-ton "LD-AC" oxygen-blown converter. The accuracy of the readings obtained was confirmed by spot checks with immersion thermocouples. A Pt:10% Rh-Pt thermocouple similarly installed in a 40-ton converter with oxygen-enriched blast proved less reliable. Protection of the thermocouples by ceramic materials and the installation and changing of the measuring lances are described in detail.

NEW PATENTS

Fuel Cells

THE ELECTRIC STORAGE BATTERY CO. *British Patent* 910,495

An electrode for a fuel cell comprises a porous matrix of which at least the pore surfaces consist of an alloy of 1-47% nickel, 50-96% silver and balance palladium. Stated to give a high efficiency of conversion into electricity.

11 β -Methyl-5 α -Steroids

THE BRITISH DRUG HOUSES LTD. *British Patent* 912,038.

A platinum or palladium catalyst is used in the preparation of 11 β -methyl-5 α -steroids by reacting a solution in an inert solvent of the corresponding 11 β -methylene-5 α -steroid with hydrogen in the presence of the catalyst.

Anode for Electrolytic Production of Chlorine

FARBWERKE HOECHST A.G. *British Patent* 912,194

An anode for use in the production of chlorine by electrolysis of aqueous solutions of alkali metal chlorides or hydrochloric acid is formed of a base of niobium, or an alloy thereof, on which is a thin coating of one or more platinum group metals. Iridium or iridium-platinum are preferred.

Selective Hydrogenation Catalysts

THE DOW CHEMICAL CO. *British Patent* 912,444

A catalyst (suitable for the selective hydrogenation of acetylene and substituted acetylenes in the presence of di- and mono-olefins, acetylene and diolefins in the presence of mono-olefins, and diolefins in the presence of mono-olefins) is composed of a high surface area activated alumina on which is finely dispersed metallic copper activated by ruthenium, rhodium, palladium, iridium or platinum.

Catalyst Composition

AMERICAN CYANAMID CO. *British Patent* 913,449

A catalyst for oxidising hydrocarbon combustion

exhaust gases is composed of a major portion of alumina, 3-30% of vanadium pentoxide, 0.001-10% of a platinum group metal (platinum or palladium) and/or 0.1-10% of a catalytically active stable copper compound, e.g. copper oxide.

Production of Formaldehyde

HUTTENWERK OBERHAUSEN A. G. *British Patent* 913,581

In the production of formaldehyde by oxidising methane and/or homologous gaseous paraffin hydrocarbons with oxygen in the presence of a catalyst, the gaseous mixture is passed through a porous fixed bed of catalyst, e.g. pumice, and then through a metal mesh adjacent to the bed and formed of platinum or iridium or an alloy thereof, e.g. 95% platinum and 5% iridium.

Fuel Cell Electrodes

IMPERIAL CHEMICAL INDUSTRIES LTD. *British Patent* 913,592

A fuel cell has gas-permeable electrodes, one or more of which has a surface of titanium on which is deposited a platinum group metal.

Fabrication of Ruthenium

THE INTERNATIONAL NICKEL CO. (MOND) LTD. *British Patent* 913,876

Ruthenium is fabricated by compacting ruthenium powder having a surface area of 2-10 m²/g under a pressure so correlated with the surface area and the sintering temperature that, after sintering, the density is greater than 90% of the theoretical density of solid ruthenium.

Cyclopropylamines

ABBOTT LABORATORIES LTD. *British Patent* 913,898

N-benzylcyclopropylamine is prepared by hydrogenating N-benzylidenecyclopropylamine in a solvent at room temperature in the presence of a palladium catalyst.

Hydrogenation of Olefinic Compounds

ENGELHARD INDUSTRIES INC. *British Patent* 915,033

A ruthenium catalyst is used in the selective hydrogenation of an olefinic compound containing a vinyl group in admixture with an olefinic compound not containing a vinyl group.

Production of Ruthenium Compounds

THE INTERNATIONAL NICKEL CO. (MOND) LTD. *British Patent* 915,785

Ruthenium dioxide monohydrate is claimed as a new compound. It is made by reaction of ruthenium tetroxide with hydrogen at below 50°C and pressure of not over 100 p.s.i.g. The compound may be used as a catalyst on an inert carrier in the decomposition of concentrated hydrogen peroxide.

Palladium Catalysts

IMPERIAL CHEMICAL INDUSTRIES LTD. *British Patent* 916,056

A catalyst suitable for mild hydrogenation reactions, e.g. selective hydrogenation of acetylenes in the presence of olefins, is formed of palladium supported on alumina, the pores of which have a mean radius of at least 200 Ångstrom units, preferably 200–1400 Å. Palladium content = 0.01–0.40% by wt. Method of manufacture includes heating active alumina at 940°–1200°C. Gamma alumina and palladium nitrate are used.

Hydrogenation of Acetylenes

IMPERIAL CHEMICAL INDUSTRIES LTD. *British Patent* 916,057

Covers the use of the catalyst of No. 916,056 in the hydrogenation of acetylenes.

Hydrogenation of Unsaturated Aldehydes

ENGELHARD INDUSTRIES INC. *British Patent* 916,119

The olefinic bond of an α -, β -unsaturated aldehyde or ketone is selectively hydrogenated to the corresponding saturated bond by reacting the aldehyde or ketone with hydrogen in the presence of a rhodium and/or ruthenium catalyst. Supported rhodium metal or ruthenium metal is used.

Purification of Nitric Oxide

ENGELHARD INDUSTRIES INC. *British Patent* 916,693

Nitrogen dioxide and oxygen are selectively removed from a gaseous mixture containing them and nitric oxide by contacting a mixture of hydrogen, carbon monoxide or a gaseous hydrocarbon and the gaseous mixture with a platinum group metal catalyst at reaction temperature. Platinum, palladium, ruthenium or rhodium are preferred.

Electrical Contact Materials

SIEMENS & HALSKE A. G. *German Patent* 1,134,520

Alloys of 20–70% gold and balance iridium and/or rhodium, produced by powder metallurgical

techniques, are used for the operative parts of electrical contacts.

Rupture Disc

ENGELHARD INDUSTRIES INC. *U.S. Patent* 3,057,718

A rupture disc in a safety device is formed of an alloy of 99.0–99.9% platinum and at least two of gold, manganese, copper, iron, nickel, calcium, silver, lead, tin, zinc, boron, aluminium, magnesium, chromium, antimony, iridium, palladium, rhodium and ruthenium. One of these metals is present to the extent of 0.1% to less than 1%.

Cyclopentadiene Polymers

VELSICOL CHEMICAL CORP. *U.S. Patent* 3,062,800

Hydrogenated cyclopentadiene polymer is made by hydrogenating a benzene-soluble catalytic homopolymer of cyclopentadiene having 1,4 linkages with hydrogen in the presence of palladium catalyst at above 25°C until at least 60% of the initial polycyclopentadiene reactant has been hydrogenated.

Fuel Cell Electrode

THE ELECTRIC STORAGE BATTERY CO. *U.S. Patent* 3,062,902

A fuel cell electrode is formed of a porous matrix the pore surfaces at least of which consist of an alloy of 1–47% nickel, 50–90% silver and 3–15% palladium, all by wt.

Alloys

UNION CARBIDE CORP. *U.S. Patent* 3,063,835

A corrosion-resistant alloy is formed of 0.005–5% by wt. in all of at least one platinum group metal and/or rhenium and balance titanium.

Method of Coating Metal

ENGELHARD INDUSTRIES INC. *U.S. Patent* 3,066,042

A body of molybdenum, tungsten, tantalum or titanium is coated by spraying a molten platinum group metal onto the surface as a thin coating, shot peening the coating and heat-treating it at 600°–1400°C to promote solid diffusion of the coating. These steps are repeated until a sufficiently thick platinum metal coating is obtained.

Thermocouples

ENGELHARD INDUSTRIES INC. *U.S. Patent* 3,066,177

The positive element of a thermocouple consists of 3–15% gold, 55–83% palladium and 14–34% platinum, and the negative element of 60–65% gold and 35–40% palladium.

Brazing Alloy

WESTINGHOUSE ELECTRIC CORP. *U.S. Patent* 3,070,875

A filler metal composed, by wt., of 30–50% of nickel, up to 3.5% of silicon and/or beryllium and balance palladium is used for brazing stainless steel members.