

causes surface deterioration at light loads. Fractured sintered compacts have the most stable surfaces, but cold-formed and electrodeposited surfaces deteriorate only slowly if abrasion is minimised.

Properties and Behaviour of Precious Metal Electrodeposits for Electrical Contacts

H. C. ANGUS, *Trans. Inst. Metal Finishing*, 1962, **39**, (1), 20-28

Au, Rh, and Pd contact coatings electrodeposited from conventional electrolytes have been examined. The importance in the performance of the contacts of the thickness, hardness, and electrical resistivity of the deposits is discussed. Results of exposure tests under various conditions show that porosity of the coating has a significant effect on the behaviour of the contacts. Effects of mechanical wear during service are also discussed. Suitable deposit thicknesses are suggested for each metal.

ELECTRONICS AND TELECOMMUNICATIONS

The Solion

K. JOACHIM, *Elektronik*, 1962, **11**, (1), 7-11

The electrochemical principles underlying the operation of the solion are discussed. This electrochemical control cell consists basically of Pt electrodes in a KI/I₂ solution. Devices which incorporate the solion include electrochemical diodes, flow- and pressure meters, integrators, multipliers, and electrokinetic pressure generators. The simplicity of construction of the

solion and low current requirements are emphasised.

TEMPERATURE MEASUREMENT

Progress in Platinum Resistance Thermometry

C. R. BARBER and J. A. HALL, *Brit. J. Appl. Phys.*, 1962, **13**, (4), 147-154

The history of the development of Pt resistance thermometry is discussed. Various thermometers designed for the measurement of temperatures in the ranges -183° to 630°C and 630° to 1063°C , and below -183°C are described. Improvements in accuracy have been achieved by refinements in and new methods of measurement and by better reproducibility of fixed calibration points. Methods of measurement based on the potentiometer, the Wheatstone bridge and the Kelvin double bridge are outlined. The role of the Pt resistance thermometer in the International Practical Scale of Temperature is discussed and the extension of its use for measurements up to 1063°C and down to 20°K is predicted. (34 references)

An Improved Resistance Thermometer Bridge

ANON., *Nat. Bur. Stds. Tech. News Bull.*, 1962, **46**, (2), 8-10

A modified Mueller bridge for use with a Pt resistance thermometer is described. The addition of a lower resistance decade has increased maximum measurement definition to $1\ \mu\text{ohm}$. The range of the instrument is 0 to 422 ohms.

NEW PATENTS

Semiconductors

WESTINGHOUSE ELECTRIC CORP. *British Patent* 888,829

A junction is formed in a silicon carbide single crystal by applying to a crystal of one conductivity type an alloy comprising palladium and/or rhodium and a doping impurity for converting a region of the crystal into a different conductivity type so that a junction between the region and the remainder of the crystal is produced. The alloy consists of 78.5-99.5% platinum, palladium and/or rhodium, and 10-0.5% lead, tin and/or bismuth.

Electrochemical Detectors

UNION CARBIDE CORP. *British Patent* 888,915

A detecting electrode comprising a strip of platinum having a number of bosses on both sides is used in an electrochemical detector device.

Catalysts

THE DISTILLERS CO. LTD. *British Patent* 888,999

A catalyst for selective hydrogenation of an acetylenically unsaturated compound to the corresponding ethylenically unsaturated compound is made by contacting a platinum group metal, supported on a carrier, with a solution of a lead compound in an organic solvent. Palladium on calcium carbonate, or on charcoal, or on barium sulphate may be used.

Electrode Structures

IMPERIAL CHEMICAL INDUSTRIES LTD. *British Patent* 889,147

An electrode structure consists of an anodically polarisable metal (titanium, titanium-base alloy, niobium, tantalum or alloy of titanium with niobium and/or tantalum), to the surface of which is secured a platinum group metal in reticulate

wrought form, e.g. wire mesh, perforated foil, expanded metal, etc.

Pyrimidines

IMPERIAL CHEMICAL INDUSTRIES LTD. *British Patent* 890,076

2:6-dihydroxy-pyrimidines are produced by oxidation of a 4-hydrazino-2:6-dihydroxy-pyrimidine of given general formula in air or oxygen and in the presence of a platinum oxide catalyst.

Preparation of Cyclohexanone

STAMICARBON N.V. *British Patent* 890,095

Cyclohexanone is prepared by passing gaseous phenol and hydrogen over a platinum group metal catalyst, preferably palladium, at below 250°C.

Method of Oxygen Determination

THE BRITISH OXYGEN CO. LTD. *British Patent* 890,923

Apparatus for determining the concentration of oxygen in solution in an electrolyte includes a silver tube as an anode in which is mounted coaxially a platinum wire forming a cathode, the space between the wire and the wall of the tube being filled with electrically insulating material.

Method of Making Filters

ENGELHARD INDUSTRIES INC. *British Patent* 891,181

A filter is made by feeding a platinum metal rod into a gas flame in an open-ended combustion conduit, melting the end of the rod and expelling molten metal in the form of globules from the end of the rod by means of a high velocity gas, the globules passing into a coolant and the resultant shot being packed into a frame and fritted.

Coated Particles

VARCO INC. *British Patent* 891,494

Particles of thermo-plastic material are prepared for chemical nickel coating by first depositing a thin discontinuous coating of metallic copper on the particles and then activating the copper by immersion in a solution containing palladium to cause replacement of some of the copper by metallic palladium.

Electrodes

IMPERIAL CHEMICAL INDUSTRIES LTD. *British Patent* 891,720

Electrodes for electrolytic purposes are made by compacting powdered titanium, or an alloy thereof with 5% zirconium or 2.5% nickel, to form a sheet and then scattering on one or both surfaces of the sheet powdered platinum or a mixture of platinum and an oxide of lead, the coated sheet being then rolled.

Electrically Heatable Filaments

NATIONAL RESEARCH DEVELOPMENT CORP. *British Patent* 892,530

An electrically heatable filament of the helical

coil type used for detection of combustible gases in air is embedded in a layer or layers of an oxide or other refractory forming a coating or pellet, on which is a layer of palladium or a mixture of platinum and palladium to form a catalyst. The filament is preferably formed of a wire of a platinum group metal or alloy.

Preparation of Dibenz (b,f,) azepines

SMITH KLINE & FRENCH LABORATORIES U.S. *Patent* 3,016,373

10, 11, -dihydro-5H-dibenz (b,f,) azepines of given formula are formed by dehydrating with phosphorus of given formula to form a 5H-dibenz-(b,f,) azepine and hydrogenating the latter in the presence of a platinum or palladium catalyst.

Film Resistor

RESISTANCE PRODUCTS CO. U.S. *Patent* 3,018,198

A film-type resistor is made by applying to an insulating base by vacuum evaporation at at least 2000°C a film composed of 10-75% by wt. copper and balance platinum, to a thickness of 50-1500 Å and then heat-treating the film in an oxidising atmosphere at from 150°C for 1 h to 350°C for 1 min.

Preparation of 1-acetyl-2, 2, 3-trimethylcyclobutane

THE GIVAUDAN CORP. U.S. *Patent* 3,019,263

1-acetyl-2, 2, 3-trimethylcyclobutane is made by heating 2, 2-dimethyl-3-acetyl-cyclobutylacetaldehyde in the presence of palladium at from 100° to 300°C, the reaction mixture being continuously withdrawn.

Platinum Catalyst

SOCONY MOBIL OIL CO. U.S. *Patent* 3,025,247

A catalyst is made by contacting an inorganic refractory oxide support with an aqueous solution of a water-soluble compound of a platinum metal in a concentration corresponding to 0.01-5 wt. % of the metal on the finished catalyst basis, contacting the resulting aqueous slurry with a solid metallic element, higher in the electromotive series than the platinum metal, in amount sufficient to reduce ions of the platinum metal to the metallic state and to deposit and fix the latter on the support.

Platinum-alumina Catalyst

SOCONY MOBIL OIL CO. U.S. *Patent* 3,025,248

A platinum-alumina catalyst is made by impregnating a hydrous alumina having a phase composition, on a total solids basis, of 5-50% by wt. of alpha alumina monohydrate and 50-95% by wt. of alumina trihydrate (mainly beta form), with a solution of a platinum compound of concentration to give 0.01-5 wt. % platinum, drying the composite, mixing it with an aqueous acid solution, drying and calcining at elevated temperature.