

range 1560–1670°C. The causes of errors in the pyrometer measurements are explained. Precautions to be taken in the use of immersion thermocouples in steelworks are described and causes of error in their use are also given in detail. (16 references.)

**Modern Trends in Resistance Thermometry**  
P. H. STIRLING and H. HO, *Ind. Eng. Chem.*, 1960, **52**, (7), 49A–51A

Developments which have improved the performance of noble metal and other thermocouples and resistance thermometers are described.

## NEW PATENTS

### Low-stress Electrodeposited Rhodium

SEL-REX CORP. *British Patent* 836,475

Rhodium is deposited from an aqueous sulphuric acid bath containing rhodium sulphate and magnesium sulphamate—preferably 30 g/l, dissolved therein.

### Hydrogenation of Aromatic Amino Compounds

ABBOTT LABORATORIES *British Patent* 836,951

A ruthenium hydrogenation catalyst is used in a process of catalytically hydrogenating aromatic amino compounds to produce the corresponding alicyclic amino compounds by passage of the aromatic compound through a reaction zone for reaction with hydrogen at 200–260°C in the presence of the catalyst. Ruthenium metal supported on activated carbon pellets or an oxide or salt of ruthenium may be used.

### Spinning Nozzles

W. C. HERAEUS G.M.B.H. *British Patent* 837,236

A spinning nozzle is composed of an alloy of palladium with 7–15% iridium and 15–30% rhodium. Up to 15% of the palladium may be replaced by other platinum group metals. The alloy is easily machinable and polishable, chemically and mechanically stable and heat-treatable.

### Electrodeposition of Platinum

THE MOND NICKEL CO. LTD. *British Patent* 838,350

Platinum is deposited from an aqueous acidic chloride-chloroplatinate electrolyte containing 180–300 g of anhydrous hydrogen chloride per l and 10–50 g of platinum per l at 45–90°C, the conditions of electrolysis being such as to maintain the rate of deposition of platinum on the cathode such that, when plotted against the hydrogen chloride concentration, it lies within a specified area shown on the drawing.

### Brazing and Alloys therefor

THE MOND NICKEL CO. LTD. *British Patent* 838,949

A brazing alloy contains 10–60% copper, 10–50% nickel, 1–30% manganese and balance of at least 10% palladium. The alloy is stated to be superior to existing alloys used for joining metal parts at temperatures of 550°C and above.

### Brazing and Alloys therefor

THE MOND NICKEL CO. LTD. *British Patent* 838,950

A ternary copper-palladium-manganese brazing alloy has a composition falling within an area A-B-C-D of a ternary diagram, the area being bounded by lines joining the following points:

Pd	Cu	Mn
20	36	44
35	28	37
44	30	26
47	38.5	14.5
43	47	10
40	50	10
10	48	42

### Brazing

THE MOND NICKEL CO. LTD. *British Patent* 838,951

Metal parts for use at 550°C and above are brazed with a ternary copper-palladium-nickel alloy falling within a specified area of a ternary Cu-Pd-Ni diagram shown, the area being bounded by lines joining the following points:

Pd	Ni	Cu
21	10	69
50	10	40
56	20	24
49	40	11
30	57	13
15	60	25
10	55	35
10	25	65

### Catalytic Reforming

SOCONY MOBIL OIL CO. INC. *British Patent* 839,106

A hydrocarbon mixture boiling in the gasoline range is reformed by contacting it with a catalyst consisting of a mechanical mixture of particles of less than 10 microns diameter of (1) a porous inert carrier on which is deposited a platinum group metal in amount to give 0.05–5% by wt. of the metal in the final catalyst and (2) eta alumina activated with halogen in amount to give a final halogen content of 0.1–0.9%. The resulting mixture has a dehydrogenation activity of at least 50 and an acid activity of at least 0.2.

### Isomerisation of Alkanes

ENGELHARD INDUSTRIES INC. *British Patent* 839,421

A catalyst composition for isomerisation of light normal alkanes consists of 0.05–5% by wt. palladium (based on total catalyst wt.) on a support of 5–25% borica and remainder alumina. The alumina consists of gamma-alumina modi-

fications resulting from drying and calcining a mixture of precursor hydrous alumina phases containing 55-95% trihydrate and remainder amorphous and/or boehmite.

#### Treatment of Tobacco

JOHNSON, MATTHEY & CO. LTD. *British Patent* 841,074

Smoking tobacco is rendered carcinogenically inactive when burnt by dusting on to the tobacco, or impregnating the tobacco with, a platinum group metal catalyst, preferably platinum.

#### Isomerisation Catalyst

SOCONY MOBIL OIL CO. INC. *British Patent* 841,174  
Pentane is isomerised by contacting it with a catalyst comprising 0.01-5% by wt. of platinum or palladium supported on a synthetic composite silica and alumina containing 10-40% by wt. alumina. The composite is made by precipitating the alumina upon a slurry of silica hydrogel.

#### Electric Lamps

PHILIPS ELECTRICAL INDUSTRIES LTD. *British Patent* 843,252

The invention concerns an electric lamp in which the portion of the supply conductor inside the pinch consists of a refractory metal foil to which is secured a metal wire extending partly inside the pinch and partly outside the lamp, the pinch having a temperature of over 300°C during operation. The invention consists in forming the wire of platinum of at least 0.3 mm thick, the thermal capacity of such wire being sufficient to withstand the high temperature of the quartz glass forming the pinch.

#### Production of Nitric Oxide

BADISCHE ANILIN SODAFABRIK A.G. *British Patent* 843,597

High percentage nitric oxide is made by subjecting a mixture of 1 part by vol. of ammonia and 1.28-1.40 parts by vol. of oxygen to oxidation at a catalyst containing platinum metal in the presence of steam.

#### Bath for Electrodeposition of Rhodium

SEL-REX CORP. *German Patent* 1,072,047

The electrolytic bath for depositing rhodium with low internal stress disclosed in German Patent 1,068,081 and comprising, per l of solution, 20-100 ml free sulphuric acid, about 2-5 g of rhodium (as rhodium sulphate), 10-100 g of magnesium sulphate and remainder water, is modified by replacing the magnesium sulphate wholly or partly by 10-100 g of magnesium sulphamate.

#### Control Rod Alloy

U.S. ATOMIC ENERGY COMMISSION *U.S. Patent* 2,935,401

An alloy for use as a neutronic reactor control rod is composed of about 1.5 wt.% of platinum,

ruthenium, rhodium, osmium or palladium, up to 10% of cadmium, 2-20% of indium and balance silver.

#### Preparation of 2,2,4,4-tetraalkylcyclobutane, 1,3-diols

EASTMAN KODAK CO. *U.S. Patent* 2,936,324

2,2,4,4-tetraalkylcyclobutane-1,3-diols are prepared by hydrogenating the corresponding 2,2,4,4-tetraalkylcyclobutane-1,3-dione in the presence of a catalyst consisting of elemental ruthenium.

#### Catalyst

THE PURE OIL CO. *U.S. Patent* 2,937,214

A hydrocarbon isomerisation catalyst is made by impregnating a precalcined silica-alumina support (50-95% by wt. silica) with a 5-30% solution of a C<sub>1</sub>-C<sub>5</sub> carboxylic acid and a solution of a reducible palladium compound in amount to give a palladium concentration of 0.01-1% by wt., drying at about 225-350°F and reducing with hydrogen at 750-975°F.

#### Spinning Nozzles

K. RUTHARDT *U.S. Patent* 2,938,788

A spinneret element is formed of an age-hardened alloy of 70-80% palladium and 20-30% iridium.

#### Metal Coated Resin Particles

UARCO INC. *U.S. Patent* 2,939,804

A coated pressure- and heat-sensitive particle is composed of a resinous thermoplastic substance with a coating of metallic copper containing a small amount of metallic palladium and an outer coating of metallic nickel.

#### Noble Metal Catalyst

UNIVERSAL OIL PRODUCTS CO. *U.S. Patent* 2,939,847

A platinum catalyst is made by impregnating alumina with chloroplatinic acid in amount sufficient to yield 0.01-5% by wt. platinum in the final catalyst, subjecting the resulting composite to air-oxidation, adding sulphuric acid (0.3-3% by wt. of final catalyst) and then calcining at 800-1200°F.

#### Catalysts

UNIVERSAL OIL PRODUCTS CO. *U.S. Patent* 2,944,032

A catalyst is made by treating alumina with aluminium nitrate (1-10% by wt. of the alumina), impregnating it with a platinum compound to form a platinum-alumina composite and treating the composite with nitric oxide or nitrogen peroxide.

#### Preparation of Melamine

MONSANTO CHEMICAL CO. *U.S. Patent* 2,945,035

Melamine is prepared by heating together hydrogen cyanide and nitric oxide at 400-800°C in contact with a palladium catalyst.