ABSTRACTS

1. **Nickel-cadmium batteries in aircraft—**

(Inco-Mond Magazine, No. 11, 30, 1959).

2. **Comparison of the Service characteristics of various types of aircraft electrical accumulator—**

A. Sageau et. al. (Docacro, No. 54, 33, 1959; abs. in Nickel Bull., **32**, 247, 1959). Review of the characteristics of lead, zinc-silver and nickel-cadmium batteries in relation to the main operational variables involved in aeronautical service.

3. **Chromate and phosphate treatments for corrosion protection—I—**

D. J. Fishlock (Corrosion Prevention and Control, **6**, No. 8, 42, 1959). Genaral principles, copper-base alloy treatments, phosphating applications; tin, silver, chromium, magnesium and aluminium treatments.

4. **Special treatments for dyed anodized aluminium—**

(Ind. Finishing, **11**, No. 135, 40, 1959). Special treatments after anodising have been discussed.

5. **Tin-nickel electroplate—**

(Inco-Mond Magazine, No. 11, 17, 1959). Advantages of this alloy plate for watches and drawing instruments.

6. **Codeposition of tin-nickel plate from organic and mixed aqueous-organic solvents—**

T. T. Campbell and R. Abel (U.S. Bur. Mines, Report. Invest. No. 5482, 1959). Promising results were obtained from electrolytes containing tin and nickel chlorides dissolved in triethanolamine—hydrochloric acid or in ethylene glycol-water baths. Current efficiencies were close to 100 per cent, and the 65 per cent tin alloy plate was found to have the same single-phase structure that is obtained from the commercially accepted fluoride-type bath.

7. **Plating anodes—**

D. J. Fishlock (Metal Industry, **95**, 162, 177, 1959). Introduction, alloy anodes, copper and nickel anodes, anode slimes. Two tables giving typical analyses and B.S.S. for anodes.

8. **Structure and wear resistance of electrodeposited ferrous coatings. Effect of electrolysis conditions—**

Iu. N. Petrov (Metal Finishing, **57**, No. 10, 72, 1959). Properties of plates obtained from the chloride bath with additions.

9. **Science for electroplaters. 51. copper bath analysis. 52. copper plating-IV—**

L. Serota (Metal Finishing, **57**, No. 10, 77 No. 11, 80, 1959).

10. **Lead plating from the pyrophosphate bath—**

(Miss) Vasanta Sree (J. Sci. and Ind. Research, **18 A**, 478, 1959). The pyrophosphate bath has been studied in detail for the plating of lead, and the optimum operating conditions established. The deposits are finer grained than those from acid baths. The throwing power of the plating solution is high, 60-88 per cent as per Field formula, and 6-20 per cent using the Gardam equation.

11. **A new economic method of treatment of stainless steels prior to cadmium plating from conventional cyanide solutions—**

L. Domnikov (Plating, **46**, 481, 1959). Immersion—activation, nickel flash from a chloride-boric acid solution, and cadmium cyanide plating.

12. **Factors in successful plating on magnesium—**

J. P. Levy (Products Finishing, **24**, No. 1, 45, 1959).

13. **Automatic polishing with special reference to the use of liquid polishing compositions—**

H. Silman and R. G. Hughes (Sheet Metal Ind. **36**, 119, 1959). Topics dealt with include polishing by bobs, mops and abrasive belts; abrasives; composition applications, and various types of automatic and semi-automatic polishing machines.

14. **Study of bright cadmium plating (effect of addition agents on the formation of bright deposits)**—

T. Hayashi and T. Ishida (J. Met. Fin. Soc., Japan **10**, No. 1, 26, 1959). Cathodic polarization measurements were carried out in the presence of several addition agents and the deposits analysed by electron diffraction and microscopy. Organic compounds in combination with metallic salts decreased the cathode potentials to 70-150 mv, and yielded bright deposits of specific preferred orientation.

15. **Some recent trends in chromium plating**—

S. Ramachandran (Electroplating, India, **1**, 197, 1959). Review with 19 references.

16. **Electropolishing**—

I. Sanghi and S. Visvanathan (Electroplating, India, **1**, 207, 1959). Review with 27 references.

17. **The story of nickel plating**

G. Dubpernell (Plating, **46**, 599, 1959). This article, which is based on a bibliography of 203 items, represents a concise but comprehensive historical survey of the main developments in nickel plating.

18. **Rhodium plating processes**—

(Ind. Finishing, **11**, No. 136, 27, 1959). New methods avoid the disadvantages of conventional rhodium plating and produce a satisfactory coating for many applications.

19. **Plating and polishing in the U.S.S.R.**

W. G. Cass (Ind. Finishing, **11**, No. 136, 42, 1959). A survey of recent technical literature from the U.S.S.R. shows that work is being carried out on hardness and wear resistance of electrolytic coatings; on corrosion prevention; and on bright nickel plating.

20. **Specifications for protective plating-2**—

E. A. Ollard (Corrosion Prevention and Control, **6**, No. 9, 42, 1959). Radio chassis, telephone switchgear, screws, small tools, table ware, jewellery, etc.

21. **Metal finishing technology—A students' guide**—

A. Alexander (Metal Finishing J, **5**, 361, 1959). First of a series of articles to work through the syllabus covering a scheme of examination in metal finishing.

22. **Treatment of combined finishing wastes**—

A. G. Winger (Metal Finishing, **57**, No. 11, 60, 1959). Ion exchange provides the key to the problem of handling toxic wastes in the rinse water from nearly 20 different plating, anodizing and metal finishing baths at a plant of Raytheon Co. in the U.S.A. Paper describes the treatment under: extraction of contaminants, processing regeneration wastes and supplementary system. Includes schematic flow diagram of treatment system, and tables giving list of plating and metal finishing solutions used and regeneration conditions for ion exchange units.

23. **Corrosion of aluminium and its inhibition**—

T. L. Rama Char and J. Sundararajan (Chem. Age of India, **10**, No. 4, 503, 1959). The importance of corrosion of metals and their prevention has been outlined. The corrosion of aluminium in acid, neutral and alkaline media has been reviewed with reference to corrosion rates, inhibitor efficiencies and corrosion potentials. The investigations carried out by the authors have been reported. The practical and theoretical aspects of inhibition of metallic corrosion have been discussed. Four tables and 35 references.

24. **Tensammetric studies on corrosion inhibitors. Part I. dicyclohexylamine nitrite**—

K. S. Rajagopalan, V. K. Venkatesan and K. Balakrishnan (Proc. Ind. Acad. Sci., **50A**, 272, 1959). The usefulness of tensammetric studies in elucidating the mechanism of corrosion inhibition by dicyclohexylamine nitrite, which is now widely used as a vapour phase corrosion inhibitor, is brought out. The results have been compared with potential measurements and direct corrosion tests.

25. **The adsorption of aromatic amines at the interface: mercury-aqueous acid solution—**

E. Blomgren and J. O'M. Bockris (J. Phys. Chem, **63,** 1475, 1959). Electrocapillary studies have been made of several amines in aqueous hydrochloric acid. The surface coverage by an amine on mercury parallels the corrosion inhibiting effect of the substance at iron.

26. **Factors influencing corrosion—**

G. V. Akimov (Corrosion, **15,** 455t, 1959). Introduction, external factors, internal factors.

27. **Stress corrosion — The engineer's view—**

P. H. Wall (Royal Aeronaut. Soc. J. **63,** 354, 1959). Choice of metals known to be susceptible to stress corrosion. Means for use in design and manufacture to avoid trouble. Aluminium-zinc, aluminium-copper and other alloys.

28. **The permanent anode in impressed-current cathodic protection systems — Part I —**

C. A. Curtis (Corrosion Technology, **6,** 296, 1959). This paper describes in a general way the properties, uses and limitations of the principal materials used as anodes in impressed-current cathodic protection systems, together with some indication of the effects of different environments upon the various materials. In this first part, graphite, silicon, iron and scrap steel are discussed.

29. **Electrode potentials and corrosion—**

W. F. Higgins (Corrosion Technology, **6,** 313, 1959). Normal electrode potentials, galvanic series of metals, galvanic or bimetallic corrosion; dependence on electrolyte, cadmium magnesium, zinc-magnesium, magnesium alloys, aluminium alloys, silver, copper, tin, zinc.

30. **Inhibition of the corrosion of aluminium in alkaline solutions: Polarization studies—**

J. Sundararajan and T. L. Rama Char (J. Sci. and Ind. Res, **18B,** 496, 1959). Results of polarization studies for 99.5 per cent aluminium in 0.3N sodium hydroxide. Table gives effect of current density on the weight loss as well as polarization of the aluminium cathode and anode, with and without dextrin inhibitor. Cathodic or anodic protection of the metal is not possible under the experimental conditions. It is concluded that the corrosion process occurs under cathodic as well as anodic control, with predominance of inhibitor action on the anodic areas of the metal surface.

31. **Corrosion inhibitor evaluation from cathodic polarization measurements—**

R. A. Legault and N. Hackerman (Corrosion, **15,** 517t, 1959). Relative corrosion rates of iron and steel in systems buffered to a pH of 5 can be determined from cathodic polarization measurements in the presence of an oil phase, carbon dioxide and commercially used amine inhibitors. Method described provides a rapid and relatively accurate means of evaluating the efficiency of industrial corrosion inhibitors in systems which simulate operating conditions.

32. **Corrosion inhibitors for cast iron and other metals in ethylene glycol solutions and in mains water—**

A. D. Mercer and F. Wormwell (J. Appl. Chem. **9,** 577, 1959). The behaviour of sodium benzoate, sodium nitrite, disodium hydrogen phosphate and potassium chromate as inhibitors has been examined for the corrosion of cast iron, copper, aluminium and mild steel. Electrode potential time curves for various metals in ethylene glycol solutions have consistently reflected the corrosion behaviour of these metals in the solutions studied.

33. **Corrosion inhibitors for ethylene glycol solutions, with particular reference to cadmium-plated and terne-plated steel—**

A. D. Mercer and D. M. Brasher (J. Appl. Chem, **9,** 589, 1959). Sodium benzoate and nitrite, and D.T.D. 779 are effective inhibitors in ethylene glycol solutions.

34. **Some properties of oxide films formed during aqueous corrosion—**

J. S. Llewelyn (J. Inst. Metals, **88,** 24, 1959). Measurements of the electrical capacity and conductivity of the surface oxide layers formed on uranium alloys suggest that the effect of corrosion-product hydrogen is to change the conductivity without altering the thickness of the layer. The relationship between the conductivity and the rate of corrosion is discussed.

35. **The use of platinum anodes in organic anodic processes—**

M. J. Allen (Platinum Metals Review, **3,** 131, 1959). Review of the mechanism of electro-organic oxidation reactions, and outline of some of the important syntheses capable of being effected with the aid of platinum anodes.

36. **Electrolyte copper refining at high current densities—**

S. J. Wallden et. al (J. Metals, **11,** 528, 1959). Copper refining experiments conducted at current densities up to 500 amps/sq. m. in specially constructed channel cells in Sweden.

37. **Report of the chlor-alkali Committee of the Industrial Electrolytic Division for the year 1958—**

C. A. Hampel and Nelson J. Ehlers (J. Electrochem. Soc, **106,** 906, 1959). Chlorine-caustic, soda ash, miscellaneous chemicals and metals: production, expansion and technical developments.

38. **Nuclear power for India—**

(Internat. Atomic Energy Agency Bull., **1,** No. 3, 13, 1959). Introduction, present pattern and future demand, available resources, immediate needs, fuel cycles and cost estimates, progress of work.

39. **Precise coulometric titration of acids and bases—**

J. K. Taylor and S. W. Smith (J. Res. Nat. Bur. standards, **63A,** 153, 1959). Apparatus and techniques are described for the titration of acids and bases by constant-current coulometry. The reliability of the method is equal to or exceeds that of classical analytical procedures.

40. **Potentiometric and conductometric studies in complex formation of beryllium with 1-hydroxy—2-naphthoic acid—**

S. C. Tripathi (J. Sci. and Ind. Res., **18B,** 476, 1959). The formation of chelates of beryllium with 1-hydroxy-2-naphthoic acid has been investigated by pH and conductometric titrations.

41. **Radiation effects on materials and systems—**

R. E. Bowman and C. J. Lyons (Battelle Tech. Review, **8,** No. 10, 8, 1959). As nuclear energy reaches into new areas, materials must be developed and systems designed to stand up under the attendant radiation. Here is a discussion of the effects of nuclear radiation upon various materials and the inter-relationship of these effects in a system: introduction, the radiation environment, typical hydraulic control system, electrical and electronic components, organic materials, metals and ceramic materials, system behaviour, conclusions.

42. **Curreent distribution problems. Solution by analytical methods—**

R. H. Rousselot (Metal Finishing, **57,** No. 10, 56, 1959). Presentation of a set of methods, derived from a simple process, which make it possible to evaluate analogically the three phases of current distribution that lead to the electrodeposit and, thereby, to obtain the metal distribution by combining all the factors involved.

—T.L.R.

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