Abstracts

A. GENERAL

1 Photo – irradiated reaction between oxalic acid and dichromate in sulphuric acid—

R. P. Gupta, G. A. Rao and B. P. Gyani, Trans. SAEST, 5-4 (1970) 139. The oxidation proceeds up to the quantitative formation of CO_2, as studied by electrometric methods.

2 Impedance Titrations—

G. A. Rao and B. P. Gyani, Trans. SAEST, 5-4 (1970) 143. The design and constructional details of a transistor differencc amplifier for impedance titrations. Better sensitivity of impedance techniques in comparison with potentiometer.

3 Lead dioxide-sulphamate-lead cell systems—

S. Sarangapani, V. K. Venkatesan and M. A. V. Devanathan, Trans. SAEST, 5-4 (1970) 146. The advantage of the system as a power source of the secondary type and the beneficial effect of K^+ ions have been investigated.

4 Electrochemical oxidation of anthracene to anthraquinone—

(Miss) J. Alamelu et al, Trans. SAEST, 5-4 (1970) 148. A two-stage oxidation of anthracene to anthraquinone is described, consisting of the oxidation of chromium sulphate to chromic acid in the cell and reacting the chromic acid with anthracene outside the cell. 35 to 40% efficiency and 75 to 80% yeild, in the regeneration for the formation of chromic acid and 90% yield in the formation of antraquinone from anthracene.

5 Influence of aluminum on the high – temperature oxidation of coper—

E. S. D. Das, K. L. Bhat and K. I. Vasu, Trans. SAEST, 6-1 (1971) 1. Oxidation of Cu-Al alloys with 1 to 8% aluminium was studied in pure oxygen at 700° to 950° C. The scales are multilayered. At 700°C, all the alloys are more resistant to oxidation than pure copper, while at 900°C, prolonged oxidation is faster for low-aluminium alloys and slower for high-aluminium alloys. The initial stages of oxidation is logarithmic in nature and involves a phase-boundary process of chemisorption with a low activation energy ; this is followed by a parabolic rate law essentially controlled by Cu_2 ion diffusion, which has a high activation energy. 3 Tables, 2 figs, 26 refs.

6 A simple laboratory potentiostat—

A. Krishnan and (Mrs.) Laxmi Shankar, Trans. SAEST, 6-1(1971) 8. Circuit details of a simple potentiostat using a popular integrated d. c. amplifier.

7 Effect of $MnCl_2$ on the electrolytic oxidaiion of sodium chloride—

(Miss) S. Vasundara, K. C. Narasimhan and H. V. K. Udupa Trans. SAEST, 6-1 (1970) 11. The influence of manganese salts during the oxidation of chloride to chlorate at a lead dioxide anode and stailess steel cathode in which the formation of hypochlorite is an intermediate step.

8 Some antimony - free lead battery grid alloys—

S. Palanichamy et al, Symp. Lead Acid Batteries (Indian Lead Zinc Information Centre), March 1971. Studies on pure lead, Pb-Sb, Pb-Ca, Pb-Ca-Ag, and Pb-Ag alloys.

9 Recovery of lead from scrap battery—

A. K. Chatterjee, Symp. Lead Acid Batteries (Indian Lead Zinc Information Centre). March 1971. Principles and current practices of treating lead Battery scrap with a view to recover lead and lead alloys suitable for the production of battery plates.

10 Corrosion in refineries and its prevention:

M. H. Pandit, Petroleum and Hydrocarbons. 6—1 (1971) 93. A review. The types of corrosion in refineries and the methods of corrosion prevention.

11 Electrolytic copper refinery in Zambia:

World Mining, 23—13 (1970) 42. Discusses how 10 tons per month of electrolytic copper is produced by mining, leaching and electrowinning at Allies mine in Zambia.

12 Automated zinc cathode stripping:

World Mining 24—3 (1971) 38. Discusses the fully automatic cathode pulling, handling and stripping system at Vieille Montague's electrolytic zinc plant at Balen.

13 Separation of Hf from Zr by fused salt electrolysis:

R.N. Prasad et al, Trans. IIM, 23-1 (1971) 50. Hafnium separation in the electrowinning of Zr by fused salt electrolysis with soluble and insoluble anodes.

14 Preparation of Ta by fluoride electrolysis:

G. R. Kamat, T. K. Mukherjee and C. K. Gupta. Trans IIM, 24—1 (1971) 55. Electrolysis of K_2TaF_7 in a KCl-NaCl eutectic. Electrolytic Ta powder has subsequently been consolidated by electron-beam melting.

15 Electro-aluminising of mild-steel:

M. L. Nichani et al, Trans. IIM, 24—1 (1971) 81. Electro-alumininising was carried out in glass containers at 170° to 230° C using fused Salt bath. Useful substritute for galvanising.

16 Oxygen potential monitoring of treatment atmospheres:

R. G. H. Record, Metals Materials, 5—1 (1971) 25. Inert atmospheres used in metal heat treatment processes can be monitored by oxygen potential measurement, using a lime-zirconia solid electrolyte probe. Some applications are examined.

17 Commercial use of an Al-Zn-Mg alloy:

G. M, Young, Metals Materials, 5-2 (1971) 71. Development Al-Zn-Mg alloys, including their stress corrosion characteristics and exfoliation corrosion.

18 Electroluminescent devices:

J. Kirton and A. M. White, Endeavour, 30-109 (1971) 34. The authors discuss the design, production and operating characteristics of two types of electroluminescent device, the light-emitting diode and the electroluminescent panel, and review their present range of applications and future prospects. Although the initial predictions that semiconductor-based electroluminescent devices would prove a serious rival to conventional lamps in the field of general lighting were not confirmed, they are already being used to an increasing extent as indicators and warning lights and for information display pusposes.

19 Production of electrolytic iron powper:

S- N. Sinha. S. K. Roy and V. A. Altekar, Chem. Age India, 22-3 (1971) 141. A Process for production of iron powder directly as cathodic deposit by electrolysis. Data on process variables influencing current efficiency, energy consumption and physical properties of the deposits. 8 figs, 8 refs.

20 Samless copper crucibles for vacuum arc melting furnaces:

W. Horschemeyer, Copper, 2 (1970) 13. Electroforming as a method of production of seamless copper crucibles.

21 Copper alloys for ships propellers:

L. Bosman Copper, 2 (1970)27. Some recently developed aluminium and manganese bronzes have enhanced resistance to corrosion fatigue and cavitation-erosion.

22 Glass electrode sensitive to alkali metal ions:

Z. Boksay et al, Hung. Sci. Inst. 19 (1970) 31. For the preparation of Na-sensitive glass electrode; the glasses of Na_2O-Al_2O_3-SiO_2 system are most suitable due to the presence of negatively charged Al-O tetrahedra. The electrochemical properties of Li^+, Na^+ and K^+ ion reversible glass electrodes are discussed. 8 figs 3 refs.

23. **Semi-automatic coulometric analyser for mercaptans–**

J. Devay and T. Garai, Hung. Sci. Instr. 19 (1970) 31. A new semi-automatic instrument is described for the datermination of mercaptan sulphur of microgram order of magnitude. 2 figs, 11 refs.

24. **Protection of galvanized tanks against ground waters -**

M.J. Alcock, Australasian Corr. Eng., 14-12 (1970) 9. Deals with the protection of galvanised tanks used for the storage of ground waters which are often corro-- sive. 4 tables, 4 refs.

25. **Corrosion considerations in chemical feed systems–**

N.P. Clark. Australasian Corr. Eng., 14--12 (1970) 17. Describes the problems associated with the controlled addition of chemicals and the reasoning be-- hind the selection of particular feed systems – disinfecting agents, pH correction agents, filtration aids and fluoride addition. 5 figs.

26 **Light–induced corrosion of wood ann related materials–**

G. Leary, Australasian Corr. Eng., 14–10(1970) 9. Structure and composition of wood and the degradation of wood by light.

27 **Corrosion protection associa-- ted with hydro-electric deve- lopments in Tasmania–**

J.C.S. Bowler and W. J. McE-- wan. Australasian Corr. Eng., 14--10 (1970) 15. Surface water, ground water, atmosphere, biological and chemical effects, and corrosion mitigation measures. 3 tables, 7 figs, 5 refs.

21 **Corrosion protection and painting of ship's tanks--**

G.J. Biddle, Australasian Corr. 14–11 (1970) 7. Era of super tankers. This paper deals with the protection of the tanks in tankers by means of painting. Paint compositions given.

29 **Golvanic effects and corrosion in reservoirs--**

N.R. Beckwith, Australasian Corr. Eng., 14--11 (1970) 21. Construction of a dam using prestressed steel wires and the reas-- ons for incorporating cathodic protection of the steel wires. 3 figs, 4 refs.

30. **Corrosion prevention of aluminium by cathodic protection-**

R.P. Dambal and T.L. Rama Char, Corr. Prevention Control, 18–1 (1971) 11. Recent developments in the use of cathodic protection as a means of preventing the corros on of aluminium.

31. **Anodic dissolution of brass in acids-**

V.K.V. Unni and T.L. Rama Char. Anti-Corrosi n. 17–12(19 70)5. Anode weight loss and polarization studies of brass in nitric, hydrochloric and sulphuric acide indicate that the copper dissolves in the cuprous state in HCl while it is in cupric form in the other acids. In nitric acid, the local cell corrosion is completely stopped, when made sufficiently anodic showing a positive difference effect. 6 tables, 9 refs.

32. **Oxidation of chromised and chrome-aluminized alloys in flowing air and flue gas atmospheres-**

N.R. Chapman, B. Mickleth–waite and G.A. Pickup, Anti-Corrosion, 17–12(1970)10 and 18-1 (1971) 12. Oxidation data on alloys. Correlation between color change, reflectivity and oxidation characteristics. Both chromized and chrome-aluminized steel coatings showed parabolic oxidation rates, a change occurring after 10 hrs for chromized coatings. Activation energies of 55 Kcal/mole for the first and second stages for the chrome coatings were calculated. The oxide scale was basically Cr_2O_3 containing some dissolved iron with traces of Fe_2O_3 at the metal-oxide interface. Particles included in the coating during the diffusion process acted as vacancy sinks, reducing the numbr of voids farmed at the metal-oxide interface and hence greatly improving scale adhesion. 27 figs, 5 tables, 31 refs.

33. **Corrosion inhibitores for copper–**

M.N. Desai. S.S. Rana and M.H. Gandhi, Anticorrosion, 18-2(1971)19. A summary of inhibitors for the corrosion of copper in diverse corrosive media such as cooling water systems, sea water and salt solutions, acids, ammonia and ammonium salts, alkalis, alcohols and glycols, including the vapour phase inhibi-

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tors for copper.

34. Examination of current and metal distribution with a Hull cell–

J. Heyes, Galvanotech., 61– 12 (1970)978. Hull cell studies. Notably in the case of irregularly shaped parts, the throwing power is important. Testing method in detail. 10 figs, 5 refs.

35. Quality of electropeated plastics--

K. Wiebusch, Galvanoteck. 61-12(1970)984. Factors determin--ing the quality of plated plastics--pretreatment, moulding and in,ection, etching etc. 15 figs, 16 refs.

36. Dyeing of anodise aluminium

H. Cordel, Galvanotech. 61--12 (1970)994. Various dyeing methods of anodised aluminium. Electrolytic dyeing. Table summerizing which process is suitable for which material. 4 figs.

37. Dispersion coatings of nickel-

M. Metzger et al, Galvanotech., 61--12(1970) 998. Incorpora--tion of solids and fibres in elec--trodeposits. Dispersion coatings of nickel, used in automobile industries. 8 figs, 17 refs.

38. Mechanical, chemical and electrolytic treatment of cop--per and copper alloy--

H. Benninghoff, Galvanotech., 61--12(1970) 1009. The following processes--cleaning and degreas--ing, etching, pickling, polishing, surface treatments. 2 tables, 5 figs, 44 refs.

39. Conductivity of electrodeposited metals--

A.M. Fowler, Galvanotech., 62–2(1971) 92. Importance of conductivity in electronics. Conductivity of an electroplated metal is different from that of the pure metal. 1 fig.

40. Corrosion of tins can containing hexamethylediamine–

H: Orth, Galvanotech., 62_2 (1971)125. Corrosion of tin can by hexamethylenediamine in presence of chloride ions and humidity.

41. Continuous electroplating of strips, wires and tubes–

D. Jahn and G. Quellmann, Galvanotech., 62–2 (1971) 131. Pretreatment is of decisive influence. 7 figs, 4 refs.

42 Contact copper plating of aluminium–

A.S. Kolev, Himija Indst., 41–3 (1969) 97; Abs. Bulg. Sci Lit., 12--2(1969) 31. Optimum conc. of a non-aqueous electrolyte for contact copper plating of Al on the basis of dimethyl for--mamide.

43 Thickness of contact copper plating–

A.S. Kolev, Himija indust., 41--5(1969) 139; Abs. Bulg. Sci. lit., 12--2 (1969) 31. Influence of temp, time, water content and physico-chemical characteristics of a copper electrolyte for plating of Al and its alloys.

44 Reduction of platinum black surface oxides--

L.D, Bruke and A: Moynihan, Electrochim. Acta, 15-9(1970) 1437. The rate of reaction between anodic oxide film and H_2 in H_3PO_4.

45 Polarization in molten oxides-

F. Toussaint et al, Silicates ind., 35–718(1971) 185. Kinetics of the electrochemical processes at the surface of Pt and oxides such as SnO_2, ZrO_2 or Kaolin in molten oxides.

46 Maintenance-free rechargeable batteries--

Lead Abs. 802(1970). Rechargeable, sealed lead--acid batteries. spill--and--leak proof. The batteries utilize a jellified electrolyte.

47 Electric vehicles: the mean machines--

Lead Abs. 803 (1970), Various types of lead-acid battery powered vehicles Over 70% of all industrial trucks in England are electric.

48. Effect of surface active substances on the operation of the negative electrode of a lead accumulator –

N. N. Ozhiganova and I. A. Aguf, Electrokhim., 6-2 (1970) 239; Lead Abs. 804 (1970). A potentiodynamic study of the mechanism responsible for the effect of surface active materials on the cathodic and anodic behaviour of the electrodes.

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Y. K. Delimarsky et al, Zh, Prikl. Khim., 42–11 (1969) 2393; Lead Abs. 809 (1970). Polarographic and chrono-potentio-

static studies of the cathodic processes during the electrolysis of fused sod. hydroxide/lead oxide systems at 340 to 440°C.

50. Cathodic penetration of sodium into lead –

G.L. Teplitskaya and I.I. Astakhov, Elektrokhim.6–3(1970) 379; Lead Abs. 821(1970). An x-ray diffraction study of the penetration of sodium into lead electrode from a 10N sod. hydroxide electrolyte, and the resulting formation of considerable amouuts of a lead-sodium solid solution.

51 Electropolymerization: a new technique for applying Paint-

J.Oliver, Prod. Finish., 34-7 (1970)66; Lead Abs. 829(1970) The principles of electropolymerization involving polymer formation under the influence of electric current.

52 Discharge of lead from trilonate electrolytes-

V. S. Galinkar et al, Ukr: Khim. Zh., 36–2(1970) 150; Lead Abs. 833(1970). Effect of temp. on the electrodeposition of Pb from a trilonate bath in the presence of various organic and inorganic anions.

53. Surface resistance of super conductive thin films of electrodeposited lead-

A Septier and M. Salaun, C.R.H. Acad. Sci. Ser. B(France), 269-15 (1969)685; Lead Abs. 845 (1970) The surface of resistance of lead varies in a complex manner with the c.d. employed for electrodeposition.

54. Electric car: What is hiding under the bonnet ?-

B. Thunwall, ERA (Sweden) 43–3 (1970) 46; Zinc. Abs. 6726 (1970). New battery systems for use in electric cars. Characteristics of Zn/air battery and battery charging.

55. Zinc halide storage batteries

M.De Rossi et al, Electrotecnica 57-2 (1970) 84; Zinc Abs. 6727 (1970) Zn/bromine system with recirculating aq. electrolyte.

56. Thermodynamic properties of molten Ge-Zn alloys.

G.I. Batalin et al, Iz. Akad. Nauk. SSSR Metal, 2, (1970) 147; Zinc Abs. 6783 (1970). The emf method to investigate the thermodynamic characteristics of a wide range of Ge-Zn alloys at 1030 to 1230°K.

57. Electropolishing of zinc specimens

R.W. Powers and E.C. Jerabek, J. Electrochem. Soc., 117-8(1970) 1099. A procedure to give a better surface on pure Zn in 20% aq. H_2SO_4.

58. The electroslag remelting process,

R. C. Grower W. C. Hahn and S. K. Tarby. J. Iron Steel Inst., 208-12 (1970) 1093. A statistical stu y of the charges occurring during the electroslag remelting.

59. Theroy of porous electrode operations.

S.K. Rangarajan, Curr. Sci., 40-8 (1971) 175. Note on the theory and applications of porous electrodes extensively used in electrochemical energy conversion devices.

B. ELECTRODEPOSITION AND METAL FINISHING

1. Electrodepsition of Ni-Fe-Mo alloy –

D. Singh and L. C. Singh, Trans. SAEST, 5 – 4 (1971) 138. Optimum Conditions for the deposition of Ni - Fe - Mo alloy from a $NiSO_4$ - $FeSO_4$ - $(NH)_2$ MoO_4 - citric acid - NaCl bath. Alloys were bright, matallic, adherent and resistant to tarnish.

2. Avoid porosity in gold plating -

H. S. Campbell, Gold Bulletin, 4 - 1 (1971) 12. The use of a scanning electron microscope to investigate porosity in gold plating has emphasised the importance of ensuring the absolute cleanliness of the surfaces to be plated.

3. Gold Plating I –

C. Nozaki, K.Owada and K, Aotanni, Kin. Hyo. Gijutsu, 21 - 4 (1970) 180 ; Gold Bull., 4 - 1 (1971) 17. Comparative study of cyanide and citrate Au plating baths. A mixed cyanide - citrate bath formulation is sugg - ested for optimum results-

4. Moropology of electrodeposted Au - films –

Y. Tanabe and S. Kamasaki, J. Metal Finish. So c. Japan, 21-5 (1970) 281. Gold films on iron substrate - Two layers, a bright golden plate crystals and a dark brown spindle dendrites.