94 Polarographic determination of 0.001 ppm Ag in lead–

N. A. Kolpakova et al (Z. Anal. Khim. 23, No. 5, 665, 1968; Lead Abs. No. 601). Electrochemical concentration of Ag on a graphite electrode.

95 Batteries, secondary. Portable lead-acid and alkaline types–

(Defence Standard (U. K.) DEF. 61-9, Part 2, Issue 1, May 1970; Lead Abs No. 609). Batteries for use by the Navy, Army and Air Force Departments are listed. Data relating to voltage, capacity and overall dimensions are tabulated, as also the interchangeability criteria for lead-acid type secondary storage batteries.

96 Electrothermal equation for Anode connector components–

I. Geld and A. Ticker (Mater. Protect. 9, No. 4, 34, 1970; Lead Abs. No. 622). An electrothermal eq. has been derived to allow selection of optimum design for impressed current anode connecting rods and surrounding components used in cathodic protection systems for ships' hulls.

97 Anodic behaviour of Pb–Ag alloys in sulphuric acid—

O. Hyvarinen and M. H. Tikkanen (Acta Polytech. Scand Chem. Met. Ser., No. 89, 1969; Lead Abs. No. 625). Pb-Ag alloys are excellent anodes in electrolytic zinc plants. The alloy behaviour in sulphuric acid is studied by anodizing potentiostatically within the oxygen evolution region. The first anodic product is $PbSO_4$, then tetragonal PbO and finally beta lead dioxide and increase its stability, a feature of great importance in the electrolysis of zinc.

98 Electroless deposition of metal oxides (alpha PbO_2)–

W. Mindt (J. Electrochem. Soc. 117, No. 5, 615, 1970). Electroless deposition of PbO_2 by oxidation of lead acetate with peroxydisulphate. The variation of mixed potential and growth rate with the pH of the electrolyte was also reported.

99 Oscillopolarographic determination of Cu and Pb –

G. Spini et al (Ann. Chim. 59, No. 1, 30, 1969; Lead Abs. No. 675). Complexes of Pb (II) and Cu (II) with ferron and oxine-sulphonic acids, and the potential and current peaks used for their determination.

100 PbO_2 in the lead-acid cell—

E. J. Ritchie and J. Burbank (J. Electrochem. Soc. 117, No. 4, 299, 1970). Part 2 deals with cycling and overcharge on lead grids.

101 Morphology of Pb and PbO_2 electrodes—

G. Sterr (Electrochim. Acta 15, No. 7, 1221, 1970; Lead Abs. No. 683). Morphology of grid plate surface as a function of acid temperature.

–K. I. V.

(B) THEORETICAL ELECTROCHEMISTRY:

1 Influence of mass transport on electrocrystallization—

N. Ibl (Trans. SAEST, 5, No. 3, 89, 1970). The role of mass transport in electrocrystallization under the conditions of cation discharge alone and of the codeposition of an addition agent is discussed. 8 Figs, 24 refs.

2 Effect of cadminm plating on hydrogen extraction from plated steel—

A. T. Vagramyan et al (Trans. SAEST, 5, No. 3, 98, 1970). Studies on postplating heat treatment of cadmium plated steel in cyanide baths. Heating of the specimens plated with a crystalline coating without brightener leads to a decreased hydrogen content in steel, while those with brightener increases the hydrogen content and worsens its plastic properties. 4 Figs.

3 Metal dissolution and deposition at strained electrodes—

M. A. V. Devanathan and M.J. Fernando (Trans. SAET, 5, No. 3, 101, 1970). Experimental technique to identify the correct model of surface diffusion control during anodic dissolution and cathodic deposition on strained copper. The condition for the transition from the surface diffusion control to charge transfer control with solid electrodes is examined. 1 table, 15 figs, 26 refs.

4 Critical review of the electrochemical methods used for the investigation of corrosion rate, passivity and inhibition–

J. Horvath, A. Rauscher and L. Harekl (Korrozios Figyelo. 10, No. 3, 73, 1970). This is the Part IV of the series. Some corrosion problems in the petroleum industry are revewed. Amine-type inhibitors are stated to afford both cathodic and anodic protection even in the presence of H_2S. The applicability of the potentiostatic: polarization method for the evaluation of inhibitors and of the mechanism of inhibition is discussed. 6 figs, 29 refs (Hung)

5 Hull cell study on zinc fluoborate baths with some brightening agents–

F. Grunwald and C. V. Cluj (Electroplating and Metal Finishing, 23, No. 9, 14, 1970). Using the Hull cell, the influence of several Co (III)–amine complexes and some organic additives on the formation of bright or semi–bright zinc deposits from two fluoborate zinc plating baths is reported. 8 refs.

6 Anodic behaviour of zinc electrodes in K0H electrolytes–

M. N. Hull, J. E. Ellison and J. E. Toni (J. Electrochem. Soc, 117, No. 2, 192 1970: Zinc Abs. No. 6150). The electrochemical oxidation of Zn anodes in K0H under stationary and hydrodynamic conditions, by the use of linear sweep voltammetry and rotating ring–disc electrode techniques.

7 Hydrated nickel hydroxide potential sweep experiments–

D. M. Mac Arthur (J. Electrochem. Soc. 117, No. 4, 422, 1970; Zinc Abs. No. 6151). Potential sweep expts on nickel hydroxide film electrode in an effort to evaluate the oxidation-reduction mechanism. The data were analysed in terms of a model based on a reversible charge transfer step with a rate determining proton diffusion process.

8 Electrochemical study of exchange reactions of mercuric sulphide monolayers—

J. H. Carney and H. A. Laitinen (Anal. Chem. 42, No. 4, 473, 1970; Zinc Abs. No. 6170). Mercuric sulphide undergoes cathodic reaction involving exchange of divalent metals. This is studied by linear voltage sweep voltammetry. The solubility products were calculated from the peak potentials.

9 Inhibitory effect of amines on A. C. polarographic processes—

I. Filipovic and M. Tkalece (Croat. Chem. Acta, 41, No. 3, 159, 1970; Zinc Abs. No. 6178). The corrosion inhibitor action and surface activity of various amines were evaluated by investigating their influence on the A. C. polarographic peaks of Cd and Pb ions in various acids. The greatest inhibitor effects were observed using the phosphoric acid solution. The inhibition was dependent on pH and chloride concentration.

10 Influence of the nature of metals on the inhibiting properties of anilines—

V. P. Grigorev and V. V. Ekilik (Protect. Mitals, 5, No. 3, 234. 1970; Zinc Abs. 6179). The coefficient of corrosion inhibition of aniline derivatives depends on the electronic structure of the metals and the electron charge at the surface.

11 Kinetics of some electrode processes on a continuously renewed surface of solid metal—

N. D. Tomashov and L.P. Vershinina (Electrochem. Acta, 15, No. 4, 501, 1970: Zinc Abs. No. 6180). By a method involving continuous mechanical renewal (scouring) of the metal electrode, the kinetics of cathodic (H_2 evolution) and anodic processes were investigated in acid with and without surface active additives. Renewal of the surface had only a slight influence on the anodic polarization behaviour.

12 Differential capacitance of solid metal electrodes—

N. A. Hampson and D. Larkin (Electrochim. Acta, 15, No. 4, 581, 970). The variation of the differential capacitance at solid metal electrodes on initial electrode/electrolyte contact for Zn, Cd and Pb. Relationships are suggested between the sharpness of the differential capacitance minimum at the zero charge potential of a metal and its crystal structure as well as melting point.

13 Theory of metal surface. Charge density and surface energy—

N. D. Lang and W. Kohn (U. S. Govt. Research Develop. Repts, **70**, No. 8, AD 701344, 1070 ; Zinc Abs. No. 6313). The Jellium model of a metal surface is examined in detail. The surface energy obtained is in agreement with surface tension measurements for Zn and several other metals but not for lead.

14 Kinetic and thermodynamic studies of Zn/Zn (II), OH—

N. A. Hampson et al (J. Electroanal. Chem. Interfac. Electrochem., **25**, No. 1, 9, 1970 ; Zinc Abs. No. 6383). Potential measurements on zinc–zincate systems. The deposition and dissolution processes of zinc in alkali by galvanostatic techniques. Charge transfer is the rate-determining step in both anodic and cathodic reaction sequences.

15 Anodic dissolution of zinc in alkaline solutions—

R. D. Armstrong and G. M. Bulman (J. Electroanal. Chem. Interfac. Electrochem. **25**, No. 1, 121, 1970; Zinc Abs. No. 6384). Using rotating disc electrodes, the dissolution of zinc in both the active and passive regions is found to occur with simultaneous zinc deposition.

16 Effect of adsorption of organic substances on the electroreduction of cations—

V. K. Venkatesan et al (J. Electroanal. Chem. Interfac. Electrochem. **25**. No. 1, 85, 1970 ; Zinc Abs. No. 6425). The exchange current density values for the zinc and cadmium amalgam electrodes in sod. sulphate were measured by the galvanostatic technique with and without organic substances. The inhibition coefficient was compared with the corresponding adsorption isotherm.

17 Kinetics and mechanism of electron exchange at the Cd^{+} / Cd (Hg) interface—

A. R. Despic, D. R. Jovanonic and S. P. Bingulac (Electrochim. Acta. **15**, No. 3, 459, 1970 ; Zinc Abs. No. 6426). The theoretical aspects are examined at faradaic impedance for systems where discharge of divalent ions takes place by the two-step single-electron exchange mechanism. Exchange current densities for the two steps are evaluated.

18 Mechanism of formation of heterophase two-layer scales in the silver–zinc–sulphur system—

J. Gilewicz-Wolter (Z. Nauk. Akad. Gorn. Hutn. Krakowie, Ceram. **14**, 35, 1969 ; Zinc Abs. No. 6427). Determination of kinetic data, silver potential measurements, and a study of the contribution of inward diffusion of sulphur to the formation process of two layer scales on binary alloys. Wagner's pellet method. Ag/Ag_2S plus ZnS/Ag_2S and $(Ag–Zn)/Ag_2S/S$ systems. ZnS decreased the rate of alloy oxidation, and the factors responsible for this effect were examined.

19 Potentials of mixed Cd-In and Cd-Tl amalgams—

N. A. Dragovtseva and S. R. Dzhangushin (Elektrokhim. **5**, No. 10, 1182, 1969 ; Zinc. Abs. No. 6435). The potentials of mixed amalgams with respect to their composition. Linear mode of potential variation with the concn. was at a certain point replaced by erratic behaviour and various reasons for this are discussed.

20 Electrical resistance/temperature characteristics of Zn whiskers—

Y. P. Gaidukov and Y. Kadletsova (Z. Eksp. Teor. Fiz. 57. No. 10, 1167, 1969 ; Zinc Abs. No. 6436). Electrical resistance at 1.5 to 300 K for Zn whiskers. The temp. coefficient depends inversely on the thickness.

21 Cathodic polarization during the codeposition of Ni and Zn–

L. V. Volkov and B. P. Yurev (Electrokhimiya **5**, No. 10, 1143, 1969 ; Zinc Abs. No. 6465). Transient potential/time curves associated with the switching of current in electrolytic cells incorporating Ni electrodes and $NiSO_4/ZnSO_4$ electrolytes. Over-polarization during the combined electrodeposition of the two metals.

22 Electrochemical behaviour of Zn single crystals in aq. amines—

N V. Gudin and E. L. Chitnaw (Zashch. Metal. **5**, No. 5, 561, 1969 ; Zinc Abs. No. 6466). The behaviour of zinc single crystals in amine solutions with respect

to the structural characteristics of the electrode and the amines. The most positive potential in all amine solutions was exhibited by the most close packed pane (0001). The potentials of the various planes tended to reach the same value (typical of polycrystalline surfaces) with the passage of time. A maximum in the potential/pH relationship was dependent on the type of amine.

23 Effect of surface tension on cavitation erosion—

B. R. Lazarenko et al (Dokl. Akad. Nauk, **188**, No. 6, 1269, 1969; Lead Abs. No. 695). Cavitation erosion of lead and two other metals in water and an aq. polymer solution. The effect of surface tension on erosion was found to be dependent on the surface quality of samples.

24 Electrical double layer in molten salts—

A. D. Graves and D. Inman (J. Electroanal. Chem. Interfac. Electrochem., **25**, No 3, 349 for Part 1 and 357 for Part 2, 1970). In Part 1, a relation between the zero charge potential of a metal in contact with an electrolyte and the work function of the metal is derived and discussed. In Part 2, the temp. and potential dependence of the double layer capacitance of the liquid metal/molten alkali halide interface is discussed.

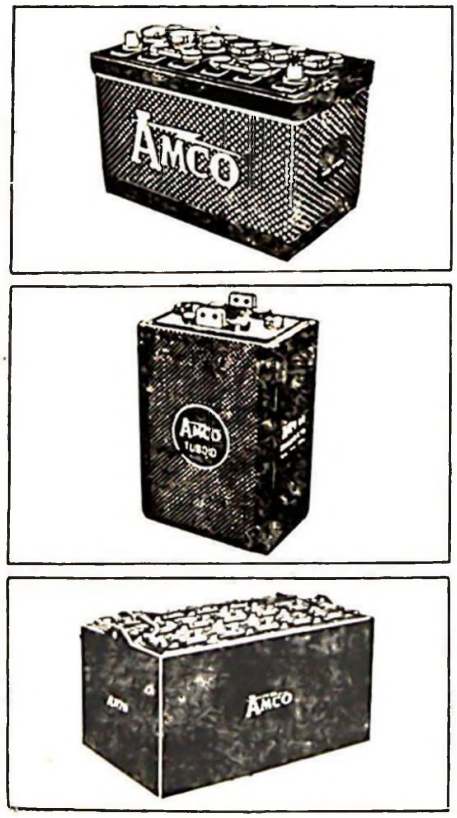
25 Solubility of Bi in fused $PbCl_2$/KCl/NaCl—

Y. K. Delimarsky et al (Zh. Prikl. Khim, **42**, No. 4, 743, 1960; Lead Abs. No. 705). The relevant equil. const was determined from emf measurements.

26 Electrical conductivity of $NaCl-CaCl_2-PbCl_2$ melts—

V. L. Zolotarev and O.I. Egerev (Zh. Prikl. Khim. **42**, No. 5, 1184, 1969; Lead Abs. No. 721). Equations are presented for the relationship between the conductivity and temp. at different lead contents of the melt.

—K. I. V.



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