A. BATTERY COMPONENTS (LEAD(II) OXIDES, ELECTROLYTE, SEPARATORS, ETC.)

A18. Innovations and developments in oxide production for lead/acid batteries.

K.H. Brockmann *(Heubach and Lindgens Eng. G.m.b.H., D-3394/1,Langelsheim, Germany)*.

J. Power Sources, 23 (1988) 87-91.

CA: 109(2) 9305e.

A19. Update of separator technology for lead/acid batteries.

J.W. Reitz *(Evanite Battery Separator, Inc., Corvallis, OR, USA)*.

J. Power Sources, 23 (1988) 109-11.

CA: 109(2) 9307g.

A20. A comparison of flooded, gelled and absorptive-separator lead/acid cells.

A.M. Hardman *(Chloride Tech. Ltd., Swinton, Manchester, UK)*.

J. Power Sources, 23 (1988) 127-34.

CA: 109(2) 9310c.

A21. Envelope-separator technology for lead/acid automotive batteries.

J. Schneider *(Grace G.m.b.H., D-2000, Norderstedt, Germany)*.

J. Power Sources, 23 (1988) 113-18.

CA: 109(2) 9308h.

A22. Volcanized rubber post seal for lead-acid batteries - a new generic type.

W.B. Brecht and S.S. Misra *(C & D Charter Power Syst., Plymouth Meeting, PA, USA)*.

INTELEC '88: Tenth International Telecommunications Energy Conference (IEEE Cat. No. 88CH2653-4), 30 Oct. - 2 Nov. 1988, San Diego, CA, USA, pp. 104-13.

B. LEAD AND LEAD ALLOYS

B73. Electrochemical behaviour of some lead alloys.

M.N.C. Ijomah *(Dep. Met. Mater. Eng., Anambra State Univ. Technol., Enugu, Nigeria)*.

J. Electrochem. Soc., 134 (1987) 2960-6.

CA: 108(12) 102905q.

B74. The effect of titanium reinforcement on the life of positive grids in lead-acid batteries.

W.A. Ferrando and K.L. Vasanth *(Corros. Technol. Group, Nav. Surf. Weapons Cent., White Oak, Silver Spring, MD, 20903-5000, USA).*

Tech. Rep. AFWAL-TR (US, Air Force Wright Aeronant. Lab.), AFWAL-TR-87-4139 (1987) 220-34.

CA: 110(16) 138600s.

B75. Effect of antimony on the anodic corrosion of lead and oxygen evolution at the $Pb/PbO_2//H_2O/O_2//H_2SO_4$ electrode system.

T. Rogachev *(Central Lab. of Electrochem. Power Sources, Bulgarian Acad. of Sci., Sofia, Bulgaria).*

J. Power Sources, 23 (1988) 331-40.

B76. Effect of rare earth metals on the anode corrosion resistance of Pb-4.5 % Sb battery alloys.

X. Tan and R. Tian *(Dep. Mater. Sci. Eng. Cent. - South Inst. Min. Metall., Changsha, Peop. Rep. China).*

Zhongnan Kuangye Xueyuan Xuebao, 19 (1988) 44-50.
CA: 109(6) 40697h.

B77. Cathode corrosion in lead-acid batteries.

T. Take and K. Akuto *(NTT Appl. Electron. Lab., Nippon Telgr. Teleph. Public Corp., Musashino, Japan, 180).*

Kenkyu Jitsuyoka Hokoku - NTT Denki Tsushin Kenkyusho, 37 (1988) 427-33.

B78. The effect of positive polarization on grid growth, cell performance and life - 'Willihnganz revisited - 20 years later'.

W.B. Brecht, D.O. Feder, J.M. McAndrews and A.J. Williamson *(C & D Charter Power Syst., Plymouth Meeting, PA, USA).*

INTEL '88: Tenth International Telecommunications Energy Conference, (IEEE Cat. No. 88CH2653-4), 30 Oct. - 2 Nov. 1988, San Diego, CA, USA, pp. 124-31.

B79. Corrosion of cathode grids of lead batteries.

V.G. Chernov and F.I. Kukoz *(Novocherk Politekh. Inst., Novocherkassk, USSR).*

Zashch. Met., 24 (1988) 972-5.

CA: 110(10) 79236c.

B80. Positive pole corrosion in lead-acid batteries.

T. Take and K. Akuto *(NTT Appl. Electron. Labs., Tokyo, Japan).*

Electr. Commun. Lab. Tech. J. (Japan), 36 (1988) 481-7; 37 (1988) 427-33.

B81. Electrochemical investigation on the behaviour of thallous ions during the formation of lead (II) sulphate.

R.G. Barradas and M. Girgis *(Ottawa-Carleton Inst. Res. Grad. Stud. Chem., Carleton Univ., Ottawa, ON, Canada).*

J. Electroanal. Interfacial Electrochem., 238 (1987) 355-65.

CA: 108(8) 64531e.

B82. Microstructure of corrosion film on lead-calcium-tin alloy cathodes in sealed lead-acid battery.

J. Yamashita, H. Yufu and Y. Matsumaru *(Yuasa Battery Co. Ltd., Takatsuki, Japan, 569).*

Denki Kagaku oyobi Kogyo Butsuri Kagaku, 56 (1988) 961-5.

CA: 110(18) 157605p.

B83. Solidification and mold-flow analysis of the casting of grids for lead-acid batteries.

M. Aoki *(Shin-Kobe Electr. Mach. Co. Ltd., Japan).*

J. Power Sources, 23 (1988) 79-84.

CA: 109(2) 9354v.

B84. Ceramic coating for molds used to cast grids of lead-acid storage batteries.

E.M. Gasko, A.V. Klaenichenko and N.A. Kutsenko *(USSR).*

Elektroteknika, 59 (1988) 78-9.

B85. Development of lead-acid batteries with copper grid (Part 2).

M. Shiomi, K. Masaaki, M. Tsubota and K. Yonezu *(Nippon Denchi K.K., Japan).*

GS News Tech. Rep., 46 (1987) 15-20.

CA: 108(18) 153600u.

B86. The hydrogen evolution reaction on lead-bismuth alloys (lead-acid batteries).

M. Johnson, S.R. Ellis, N.A. Hampson, F. Wilkinson and M.C. Ball *(Dept. of Chem., Loughborough Univ. of Technol., UK).*

J. Power Sources, 22 (1988) 11-20.

CA: 108(12) 97807c.

B87. Study of grid alloys for lead-acid battery. I. Alloys with low antimony content.

Y. Lu, J. Fang, S. Zhao, W. Gu, S. Xu and Z. Jiang *(Changchun Inst. Appl. Chem., Acad. Sin., Changchun, Peop. Rep. China).*

Yingyong Huaxue, 4 (1987) 85-7.

CA: 108(14) 115720a.

B88. Preparation of the lead-calcium alloys for the grids of lead-acid batteries and their properties.

S. Zhao, W. Gu, Y. Lu, Y. Chen, S. Luo and Z. Jiang *(Changchun Inst. Appl. Chem., Acad. Sin., Changchun, Peop. Rep. China).*

Huagong Xuebao, 3 (1987) 380-3.

CA: 108(14) 116957v.

B89. Procedures for producing electrode current collectors from lead-calcium alloys.

V.I. Bolotovskii, M. Ya Berlin and Z.I. Vaisgant *(USSR).*

Khim Istochniki Toka, L. (1987) 31-4.

CA: 109(26) 234128u.

B90. Calcium products for battery grid production: a supplier's perspective.

J.T. Nawracay *(Pfizer Inc., Wallingford, CT, 06492, USA).*

J. Power Sources, 23 (1988) 73-7.

CA: 109(2) 9304d.

B91. Low-antimonial lead and calcium-lead alloys for battery grids — a review.

G. Sivaramaiah and V.R. Subramanian *(Indian Lead Zinc Inf. Cent., New Delhi, India).*

Bull. Electrochem., 4 (1988) 797-803.

CA: 110(6) 41901c.

B92. Lead scrap processing in rotary furnaces: a review.

M. Rousseau *(USA).*

Conserv. Recycl., 10 (1987) 99-105.

CA: 108(10) 79138f.

B93. Incineration feasibility study for battery plant trash and crushed rubber battery cases.

R.M. Reynolds *(Lake Eng. and Dev., Inc., Atlanta, GA, 30328, USA).*

Proc.-APCA Annu. Meet., 80 (1987) 87/26.7.

CA: 108(16) 137295t.

B94. Melting of battery scrap in an electric furnace.

P. Shishkov, N. Shopov, V. Panchev, V.V. Kozhukharo and G. Kostov *(Inst. Tsvetn. Met., Sofia, Bulgaria).*

Metalurgiya (Sofia), 42 (1987) 13-17.

CA: 108(16) 135459a.

B95. Processing of lead-battery scrap.

A. Paulin and D. Dretnik *(Ljubljana, Yugoslavia)*.

Freiberg. Forschungsh. B, B260 (1987) 75-88.

CA: 108(16) 135432m.

B96. Processing of lead bearing mud separated from battery scrap.

I. Gyulasi, I. Molnar, L. Pohl and M. Pusztai *(Aluterv-FKI, Hungary)*.

Banyasz. Kohasz. Lapok, 120 (1987) 118-22.

CA: 108(14) 116335r.

B97. Smelting of substandard lead raw material in an apparatus for oxygen electrosmelting of battery scrap.

A.P. Sychev, M.Y. Kesler and Y.E. Korobitsyn *(USSR)*.

Tsvetn. Met. (Moscow), 6 (1988) 27-9.

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B98. Current state and prospects of battery scrap processing.

M.P. Smirnov *(USSR)*.

Tsvetn. Met. (Moscow), 2 (1988) 37-40.

CA: 108(26) 224661c.

C. POSITIVE PLATES (LEAD(IV) OXIDES)

C59. An electron diffraction study of the fine structure of α-PbO_2 and β-PbO_2 in positive active material of lead-acid battery.

H. Nishikawa, K. Fujii, H. Ochi and S. Minami *(Osaka Inst. of Technol., Japan)*.

Denki Kagaku, 55 (1987) 377-81.

C60. Structure of lead antimonate ($PbSb_2O_6$) and its relationship to the crystal chemistry of lead dioxide in antimonial lead-acid batteries.

R.J. Hill *(CSIRO, Div. Miner. Chem., Port Melbourne, Vic. 3207, Australia)*.

J. Solid State Chem., 71 (1987) 12-18.

CA: 108(8) 66428a.

C61. Comments on "Effect of chemisorbed water on the electrical capacity of the lead-acid battery positive plate".

R.J. Hill *(Div. Miner. Chem., CSIRO, Port Melbourne, 3207, Australia)*.

J. Power Sources, 22 (1988) 175-7.

CA: 108(18) 153619g.

C62. Reply to comments on "Effect of chemisorbed water on the electrical capacity of the lead-acid battery positive plate".

D. Pavlov *(Cent. Lab. Electrochem. Power Sources, 1040, Sofia, Bulgaria).*

J. Power Sources, 22 (1988) 179-82.

CA: 108(18) 153620a.

C63. Proton motion in battery lead dioxides.

J.R. Gavarri, P. Garnier, P. Boher, A.J. Dianoux, G. Chedeville and B. Jacq *(Lab. CPS, Ec. Cent. Arts Manuf., 92295, Chatenay-Malabry, France).*

J. Solid State Chem., 75 (1988) 251-62.

CA: 109(18) 153074w.

C64. Volumetric study of interaction of hydrogen with a lead dioxide electrode.

I.A. Aguf, W.K. Grigalyuk, O.Z. Rasina and T.P. Chizhik *(USSR)*.

Khim Istochniki Toka, L. (1987) 17-24.

CA: 110(2) 14961r.

C65. Effect of H_3PO_4 on the $PbSO_4/PbO_2$ electrode in H_2SO_4 solutions.

S. Sternberg, A. Mateescu, V. Brânzoi and L. Apáteanu *(Polytechn. Inst. of Bucharest, România).*

Electrochim. Acta, 32 (1987) 349-51.

C66. The coulometric study of the Pb, PbO_2, O_2 / $PbSO_4$ system.

S. Sternberg, A. Mateescu, V. Brânzoi and L. Apáteanu *(Polytechn. Inst. of Bucharest, România).*

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C67. New method for production of an armor-plate cathode for a lead battery.

V.K. Sleptsov and M.A. Dasoyan *(USSR).*

Khim Istochniki Toka, L. (1987) 25-8.

CA: 110(2) 11011v.

C68. Effect of the phase composition of paste on performance of a lead battery cathode.

G. Papazov, V. Iliev, D. Pavlov, A.I. Rusin, E.M. Zakharov, Z.I. Zhivilova and A.P. Batin *(USSR).*

Khim Istochniki Toka, L. (1987) 11-16.

CA: 110(2) 11010u.

C69. Effect of the composition of the alloy of electric contacts on the formation of positive electrodes of a lead battery.

G.A. Kolikova, M.M. Barsukova and G.E. Demin *(USSR)*.

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CA: 108(8) 59379g.

C70. Micro-zone reactions at the formation of the lead acid battery positive plates.

D. Ma, X. Zhu and Q. Gao *(China)*.

J. Shangai Jiaotong Univ. (China), 22 (1988) 81-9.

C71. Method for the determination of the composition of a mixture of two lead (IV) oxide crystalline species in the active positive mass of lead-sulfuric acid batteries.

A.G. Mateescu and D.C. Mateescu *(Intreprinderea "Acumulatorul", Bucharest, Romania)*.

Rev. Chim. (Bucharest), 39 (1988) 434-7.

CA: 110(4) 26585j.

C72. Studies of the microstructure of the positive lead-acid battery plate and its electrochemical reactivity.

J. Yamashita and Y. Matsumaru *(Cent. Lab., Yuasa Battery Co. Ltd., Osaka, Japan)*.

J. Appl. Electrochem., 18 (1988) 595-600.

CA: 109(14) 113398y.

C73. In-situ measurements of conductivity and active surface area of porous electrodes by the current step method-II. Experiments.

M. Calabek and K. Micka *(Dep. Electrotechnol., Tech. Univ., 66209, Brno, Czech.)*.

Electrochim. Acta, 33 (1987) 75-8.

CA: 108(6) 45811e.

D. NEGATIVE PLATES

D21. Effect of $CoSO_4$ additions on the $Pb/PbSO_4$ electrode.

S. Sternbeg, V. Brânzoi and L. Apáteanu *(Polytechn. Inst. of Bucharest, Romania)*.

Rev. Roumaine de Chim., 32 (1987) 121-31.

D22. Effect of some elements on oxygen reduction and hydrogen evolution at lead-acid battery negative plates.

M. Maja and N. Penazzi *(Dip. Sci. Mater. Ing. Chim., Politec. Torino, Turin, Italy).*

J. Power Sources, 22 (1988) 1-9.

CA: 108(2) 8785d.

D23. The gassing behaviour of lead-acid negative active material and development of a quality control test for lead oxide purity.

B. Culpin, M.W. Pilling and F.A. Fleming *(Chloride Adv. Res., Swinton, Manchester, UK).*

J. Power Sources, 24 (1988) 127-36.

CA: 109(14) 113432e.

D24. Kinetics of the porous lead electrode in the lead-acid battery.

D. Simonsson, P. Ekdunge and M. Lindgren *(Dept. of Appl. Electrochem. & Corrosion Sci., R. Inst. of Technol., Stockholm, Sweden).*

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D25. Factors affecting the float performance of the negative plate of the lead-acid battery.

M.E.Fiorino, F.J. Vaccaro and R.E. Landwehrle *(AT & T Bell Labs., Murray Hill, NY, USA).*

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D26. Additives to negative plate and performance of lead-acid battery (Part 3).

T. Hayashi and A. Tokunaga *(Nippon Denchi K.K., Kyoto, Japan).*

GS News Tech. Rep., 47 (1988) 15-22.

CA: 110(22) 196322p.

D27. Role of organic expander in modern lead/acid batteries.

G.J. Szava *(Borregaard Ind. Ltd., N-1701, Sarpsborg, Norway).*

J. Power Sources, 23 (1988) 119-24.

CA: 109(2) 9309j.

E. ASPECTS OF MANUFACTURE

E59. Production of lead-acid batteries with positive tubular plates.

J. Kwasnik and H. Krysiak *(Cent. Lab. Batteries Cells, Pozman, Poland).*

Bull. Electrochem., 4 (1988) 35-9.

CA: 108(20) 170754q.

E60. Glass fiber tube for lead/acid batteries.

H. Miura *(Nippon Battery Tube Co. Ltd., Tsu, Japan).*

J. Power Sources, 23 (1988) 93-7.

CA: 109(2) 9306f.

E61. Relative-humidity/temperature relationships for saturated salt solutions: applicaton to lead/acid plate curing.

A.M. Foxworthy *(CSIRO Div. of Mineral Chem., Port Melbourne, Vic., Australia).*

J. Power Sources, 22 (1988) 169-73.

E62. Rapid method for formation of a cathode of stationary lead-acid batteries.

F. Ovari and B.G. Karbasov *(Veszprem, Vegyip. Egy., Veszprem., Hungary).*

Zh. Prikl. Khim. (Leningrad), 61 (1988) 2556-7.

CA: 110(14) 118248e.

E63. Change in the composition of electrode material during lead-acid battery formation.

F. Ovari, J. Jacs and B.G. Karbasov *(Veszprem. Vegyip. Egy., Veszprem, Hungary).*

Zh. Prikl. Khim. (Leningrad), 61 (1988) 2558-60.

CA: 110(14) 118249f.

E64. Temperature-controlled formation of lead-acid batteries.

M. Bungardt *(Digatron Ind. Electron. G.m.b.H., 5100, Aachen, Germany).*

J. Power Sources, 23 (1988) 103-8.

CA: 109(2) 9355w.

E65. The measurement of ripple current in battery plants.

D. Wilson *(C & D Charter Power Syst. Inc., Plymouth Meeting, PA, USA).*

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E66. Cooling large arrays of lead-acid cells in battery energy storage systems: a plant designer's perspective.

S.W. Eckroad, C.A. Luongo and R.J. Lloyd *(Bechtel Natl. Inc., San Francisco, CA, USA).*

Electrochem. Soc., Pennington, NJ, USA, Proc. Vol. 88-11 (1988) 81-94.

CA: 108(26) 224247x.

E67. Influence of storage for one year on parameters of unserviced lead-acid batteries fabricated by the battery-forming method.

V.I. Barkovskii, T.P. Belova, M. Yu Komrakov and A.G. Gerasimov *(USSR)*.

Elektrotekhnika (USSR), 59 (1988) 6-9.

E68. Study of the sulphation in lead-acid batteries during prolonged storage.

J. Yamashita, H. Yufu and Y. Matsumaru *(Yuasa Battery Co.Ltd., Takatsuki, Japan, 569)*.

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CA: 110(12) 98765r.

E69. Design and costs for a generic 10-MW utility lead-acid battery energy storage plant.

Electr. Power Res. Inst., Palo Alto, CA, USA; 30 June 1988, 256 pp.

E70. Company gets lead out - and more.

G.R. Hartup *(Battery Salvage Div., Ace Battery, Inc., Indianopolis, IN, USA)*.

Pollut. Eng., 19 (1987) 66-7.

CA: 108(8) 61859g.

E71. Field studies of lead pollution in the vicinity of a battery plant.

N. Englert, C. Krause, H.L. Thron and B. Kleibeler *(Inst. Wasser-, Boden-Lufthyg., Bundesgesundheitsamt, 1000, Berlin, Germany)*.

Schriftenr. Ver., Wasser-, Boden-Lufthyg., 74 (1987) 123-36.

CA: 108(6) 43086y.

E72. Shifting sources of lead pollution.

D.A. Todd and J.A.S. Adams *(Wray and Todd Interests, Ltd., Huston, TX, USA)*.

Trace Subst. Environ. Health, 21 (1987) 104-12.

CA: 109(10) 78876d.

E73. Environmental sampling of lead near a battery reprocessing factory.

H.W. Leung *(Grad. Sch. Public Health, San Diego State Univ., San Diego, CA, 92182, USA)*.

Bull. Environ. Contam. Toxicol., 41 (1988) 427-33.

CA: 109(15) 124086w.

E74. Cells and batteries in hazardous areas: problems and solutions.

A.T. Austin and A.L. Bartels *(ERA Technology Ltd., Leatherhead, UK)*.

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E75. Management of lead exposure at workplaces in the battery industry.

A. Hennecke and W. Bange *(Brilon, Germany)*.

TU DATE, 29 (1988) 13-16.

CA: 108(12) 100424h.

E76. Impairment of chemotaxis of polymorphonuclear leukocytes from lead/acid battery workers.

M. Governa, M. Valentino, I. Visona and R. Scielso *(Nuovo Osp. Reg., Univ. Ancona, 60020, Torrette di Ancona, Italy)*.

Sci. Total Environ., 71 (1988) 543-6.

E77. Erosion of the teeth of workers due to sulphuric acid exposure in the storage battery industry.

Y.J. Hah and K.M. Lee *(Med. Coll., Cathol. Univ., Seoul, S. Korea)*.
K'at'ollik Taehak Uihakpu Nonmunjip, 41 (1988) 69-75.

CA: 109(12) 98075v.

E78. Thyroid function as assessed by routine laboratory tests of workers with long-term lead exposure.

M. Tuppurainen, G. Wagar, K. Kurppa, W. Sakari, A. Wanibuyu, B. Froseth, J. Alho and E. Nykyri *(Inst. Occup. Health, 00250, Helsinki, Finland)*.

Scand. J. Work, Environ. Health, 14 (1988) 175-80.
CA: 112(14) 124362v.

E79. Determination of hydrides of arsenic, antimony and tin in workplace air.

B. Pedersen *(Dan. Natl. Inst. Occup. Health, Hellerup, DK-2900, Denmark)*.

Ann. Occup. Hyg., 32 (1988) 385-97.

CA: 110(6) 44050k.

E80. Lead removal from wastewaters using chabazite tuff.

C. Correla and M. Pansini *(Dip. Chim., Ing. Chim. Mater., Univ. L' Aquila, 67040, Monteluco di Roio, Italy)*.

ACS Symp. Ser., 368 (1988) 500-10.

CA: 109(12) 98203k.

E81. Reclaim and waste treatment of lead from lead/acid battery plants.

R.D. Hallack *(A-10 Equipment Corp., Glendale, CA, 91206, USA)*.

J. Power Sources, 23 (1988) 249-53.

CA: 109(12) 98211m.

F. CHARGING AND DISCHARGING

F46. Quick-charging a sealed lead-acid battery with unregulated transformer-rectifiers.

J.S. Kuest and A.B. de Oliveira *(Boeing Mil. Airplane Co., Seattle, WA, USA).*

Electrochem. Soc., Pennington, NJ, USA, Proc. Vol. 87-16 (1987) 202-8.

CA: 108(6) 41068v.

F47. An analytical description of lead-acid battery recharging procedures.

K. Boettger *(AEG Aktiengesellschaft, Darmstadt, Germany).*

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F48. Optimum charging of a battery and its effects on charging efficiency.

M. Yamanoi and H. Naganawa *(Dept. of Electr. & Electron. Eng., Meijo Univ., Tempaku-ku Nagoya, Japan).*

Syst. Control (Japan), 31 (1987) 896-901.

F49. Charging characteristics from photovoltaic modules to storage batteries using DC-to-DC converters.

M. Hoshino, G. Kimura and M. Shioya *(Dept. of Elect. Eng., Tokyo Metropolitan Univ., Japan).*

Mem. Fac. Technol. Tokyo Metrop. Univ. (Japan), 37 (1987) 3809-14.

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K.I. Popov, V.M. Vidojkovic, M.D. Maksimovic and M.V. Vojnovic *(Fac. Technol. Metall., Univ. Belgrade, Belgrade, Yugoslavia).*

Hem. Ind., 42 (1988) 382-6.

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F51. The rapid charging of lead-acid batteries for PV systems.

P. Longrigg *(Solar Energy Res. Inst., Golden, CO, USA).*

Eighth E.C. Photovoltaic Solar Energy Conference. Proceedings of the International Conference (EUR 11780), 9-13 May 1988, Florence, Italy, pp. 1545-8.

F52. Present technological situation and prospects as regards equipment for charging stationary batteries.

P.N.M. Moreira da Silva and M.A. do Rosario Barbosa *(Portugal).*

Electricidade (Portugal), 32 (1988) 373-8.

F53. A state of charge observer for lead-acid batteries.

R. Giglioli, P. Pelacchi, M. Raugi and G. Zini *(Instituto di Elettrotecn., Pisa Univ., Italy).*

Energ. Elettr. (Italy), 65 (1988) 27-33.

F54. The constitution and the application of an on-line analyzing system for the charge-discharge characteristics using a conventional microcomputer.

Y. Kitada, S. Iura, M. Sugawara and K. Matsuki *(Yamagata Univ., Yonegawa (Japan).*

Denky Kagaku (Japan), 56 (1988) 874-9.

F55. Anomalous capacity-current behaviour of lead electrodes in sulphuric acid at very low rates of discharge.

K. Das and K. Bose *(Dep. Chem., Jadavpur Univ., Calcutta, 700 032, India).*

Bull. Electrochem., 4 (1988) 885-7.

CA: 110(8) 61041a.

F56. Analytic representation of the discharge characteristics of lead/acid batteries for a constant strength discharge current.

S.A. Saakyan *(USSR).*

Izv. Akad. Nauk Arm. SSR Ser. Tekh. Nauk *(USSR),*40 (1987) 44-7.

F57. Self-discharge of lead-acid batteries at high temperatures.

E. Okamoto, H. Tanaka and M. Tsubota *(Japan Storage Battery Co. Ltd., Kyoto, Japan).*

GS News Tech. Rep., 47 (1988) 17-22.

CA: 109(24) 213518f.

F58. Influence of surface-active substances and composition of current-carrying bases on self-discharge of lead storage battery.

A.G. Gerasimov, V.I. Barkovskii, E.I. Krasnolobova and M.Y. Komrakov *(USSR).*

Elektrotekhnika (USSR), 59 (1988) 14-16.

G. TESTING AND PERFORMANCE

G120. Developmental status of lead and alkaline storage batteries.

K. Kraemer *(Berlin, Germany).*

VDI-Ber., 652 (1987) 191-200.

CA: 108(8) 59337s.

G121. New technology for lead/acid battery testing.

D.D. Brandt *(Bitrode Corp., Fenton, Mo, USA).*

J. Power Sources, 23 (1988) 99-102.

G122. Service life of lead storage batteries as a function of degree of discharge and charging conditions.

V.S. Dubikhina, V.S. Yanchenko and I.A. Selitskii *(USSR).*

Sov. Electr. Eng., 58 (1987) 84-6.

G123. Lead-acid battery life testing and ultrasonics.

I.C. Baeringer, F.L. Tarantino and E.L. Daniels *(Exide Corp., Reading, PA, USA).*

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G124. Life cycle monitoring of tubular plate lead/acid batteries with cadmium electrodes.

N. Karuppannan, P. Lakshmanan and K. Dakshinamurthy *(CECRI Madras Unit, CSIR Complex, Madras, 600 113, India).*

Bull. Electrochem., 4 (1988) 559-61.

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G131. Effect of charge voltage on performance of lead-acid battery and its electrodes.

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E. Voss *(VARTA Batterie AG, D-6233, Kelkheim, Germany).*

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A. Ryder *(Chloride Tech. Ltd., Manchester, UK).*

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K.A. Lundqvist *(Televerket, Farsta, Sweden).*

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G151. The control of lead/acid storage battery element capacity used in hybrid PV systems.

M. Piccolo, G. Goglia, G. Mascia and D. Biondini *(Ministero Delle Poste e Delle Telecomunicazioni, Instituto Superose PT, Rome, Italy).*

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G152. The effect of positive grid alloy composition on the operation of lead-acid batteries in remote installations.

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D.O. Feder and H.-A. Kiehne *(Electrochem. Energy Storage Syst., Madison, NJ, USA).*

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C.J. Bain and P.J.W. Bruce *(Australian Lead Dev. Assoc., Melbourne, Vic., Australia).*

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A. Raychaudhuri *(Nicco Batteries Ltd., New Delhi, India).*

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K. Shimizu *(Furukawa Battery Co. Ltd., Yokohama, Japan).*

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H.R. Ibrahim *(Domar Bateri Automotif Sdn. Bhd., Selangor, Malaysia).*

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N.S. Bright *(Chloride Batteries Asia Pty. Ltd., Jurong Town, Singapore).*

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T. Riensubdee *(Siam Battery Ind. Co., Ltd., Bangkok, Thailand).*

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M. Grossoni and G. Mologni *(SIP, Rome, Italy)*.

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G.D. Brownlie *(Kabanos Pty. Ltd. Castle Hill, 2154, Australia).*

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I161. Dynamic behaviour of lead-acid batteries with special respect to photovoltaic applications.

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I162. Field experience with batteries in photovoltaic systems.

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G. Sivaramaiah and V.R. Subramanian *(Battery Soc. of India, New Delhi, India).*

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I164. Project Solarland.

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I165. Development of lead/acid batteries for domestic remote-area power supplies.

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I166. Performance of a battery storage in wind and photovoltaic stand-alone energy systems.

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I. Katic *(Dep. Meteorol Wind Energy, Risoe Ntl. Lab., Roskilde, DK-4000, Denmark).*

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H. Oman *(Boeing Aerosp. Co., Seattle, WA, 98124, USA).*

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K. Fuchida, C. Suyenaga, Y. Kasai, K. Yamasaki and H. Nakashima *(Yuasa Battery Co., Ltd., Osaka, Japan).*

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I172. Stationary sealed lead-acid battery.

M. Iwata.

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I173. Lead accumulators with gas recombination.

G. Clerici *(Italy)*.

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I174. Maintenance-free industrial lead/acid batteries.

R. Kiessling *(HAGEN Batterie A.-G., D 4700, Soest, Germany)*.

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I175. Application of valve-regulated sealed lead-acid batteries in generating stations and substations.

M.W. Migliaro *(Ebasco Serv. Inc., New York, NY, USA)*.

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I178. Valve-regulated lead/acid batteries - gas and heat management.

D. Berndt *(VARTA-Batterie AG, Kelkheim, Germany)*.

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I179. New flat sealed lead-acid batteries.

H. Tamura *(Sanyo Res. Cent., Hirakata, Japan, 573)*.

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K. Higashimoto, A. Miura, T. Hayakawa and A. Komaki *(Shin-Kobe Electr. Machinery Co. Ltd., Mie, Japan)*.

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I181. Development of "PF series" high performance sealed lead-acid battery.

N. Fujimoto, K. Kobayashi, K. Takeiama and S. Kano *(Japan Storage Battery Co. Ltd., Kyoto, Japan).*

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M. Iwata, T. Hosomi and Y. Tagawa *(Japan Storage Battery Co. Ltd., Kyoto, Japan).*

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I183. Maintenance-free lead-acid batteries.

Y. Koizumi *(NTT Corp., Tokyo, Japan).*

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I184. Sealed maintenance-free lead/acid batteries: properties and applications of a new battery generation.

H. Tuphorn *(Accumulatorenfabr. Sonnenschein Batterie G.m.b.H., D-6470, Büdingen, Germany).*

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S. Sasabe, M. Sasaki and Y. Kasai *(1st Takatsuki Works, Yuasa Battery Co., Ltd., Takatsuki, Japan).*

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J. Szymborski, J.L. Mulcahy and A.R. Abbott *(GNB Ind. Battery Co., Langhorne, PA, USA).*

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V.J. Russo *(Exide Electron., Lightguard Div., Raleigh, NC, USA).*

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I188. Product characteristics of sealed nickel-cadmium and sealed-lead rechargeable battery systems.

M.W. Mahan *(Gates Energy Product, Inc., Gainesville, FL, USA).*

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