

TABLE OF CONTENTS

Max Bredig Award Address

| | |
|---|---|
| The Simple and the Complex: Revealing the Structure of Molten Salts <i>G. N. Papatheodorou</i> | 2 |
|---|---|

Power Applications of Molten Salts

| | |
|---|-----|
| Solvent free Dye-Sensitized Nanocrystalline Solar Cell using Room-Temperature Molten Salt Electrolyte <i>K. Kawata, S. M. Zakeeruddin, and M. Grätzel</i> | 16 |
| Performance of Li-Alloy/Ag ₂ CrO ₄ Couples in Molten LiNO ₃ -KNO ₃ Eutectic Electrolyte <i>R. A. Guidotti and F. W. Reinhardt</i> | 31 |
| Investigation of the Stability of Low-Temperature Ionic Liquids with High-Activity Anodes <i>T. D. J. Dunstan, J. Caja, and R. A. Guidotti</i> | 43 |
| Investigation of the Influence of Polymer Type on the Electrochemical Behavior of Ionic Liquid/Polymer Gel Electrolytes <i>T. E. Sutto, P. C. Trulove, and H. C. De Long</i> | 54 |
| All-Lithium, Iodide-Based, Low-Melting Electrolytes for High-Temperature Batteries <i>R. A. Guidotti and F. W. Reinhardt</i> | 63 |
| Negative Electrode for Lithium Battery in Room-Temperature Molten Salt <i>Y. S. Fung and D. R. Zhu</i> | 75 |
| Direct X-Ray Diffraction Evidence for the Electrochemical Intercalation of an Imidazolium Cation into Graphite from a Room-Temperature Ionic Liquid <i>T. E. Sutto, K. D. Sienerth, H. C. De Long, and P. C. Trulove</i> | 87 |
| Ion Transport in Ionic-Liquid/Polymer Gel Electrolytes <i>R. A. Mantz, T. E. Sutto, H. C. De Long, and P. C. Trulove</i> | 94 |
| Fundamental Studies of Nickel Electrode in a Basic Na[AlCl ₄] Melt at 300°C <i>J. Prakash</i> | 102 |
| Ionic Liquids as Thermal Fluids <i>M. E. Van Valkenburg, R. L. Vaughn, M. Williams, and J. S. Wilkes</i> | 112 |

| | |
|--|-----|
| Proton Conduction of RTMS – Acid System <i>S. Mitsushima, K. Kudo, R. Sakamoto, A. Noda, Y. Takeoka, N. Kamiya, M. Watanabe, and K. -I. Ota</i> | 124 |
|--|-----|

| | |
|---|-----|
| Investigations of the Electrochemical Behavior of TrialkylImidazolium Bis(trifluoromethylsulfonimide) Ionic Liquids and Their Polymer Gel Electrolytes <i>T. E. Sutto, H. C. De Long, and P. C. Trulove</i> | 134 |
|---|-----|

Molten Salts in Synthesis, Catalysis, and Green Processes

| | |
|--|-----|
| New, Halogen-Free Ionic Liquids – Synthesis, Properties and Applications <i>P. Wasserscheid, R. van Hal, and A. Bösmann</i> | 146 |
|--|-----|

| | |
|---|-----|
| Ionic Liquids for the Dissolution and Regeneration of Cellulose <i>R. P. Swatloski, J. D. Holbrey, S. K. Spear, and R. D. Rogers</i> | 155 |
|---|-----|

| | |
|--|-----|
| Green Synthesis of Ionic Liquids and Applications in Organic Synthesis, Structure and Dynamics of Lithium Polymer Electrolytes <i>R. X. Ren, A. Brenner, J. X. Wu, and W. Ou</i> | 165 |
|--|-----|

| | |
|---|-----|
| Clean Synthesis in Ionic liquids <i>M. J. Earle and K. R. Seddon</i> | 177 |
|---|-----|

| | |
|---|-----|
| Organic Reactivity in Ionic Liquids: Nucleophilic Substitutions on Methyl <i>p</i> -Nitrobenzeneshlphonate <i>N. L. Lancaster, T. Welton, and G. B. Young</i> | 190 |
|---|-----|

| | |
|--|-----|
| Thermal Degradation Studies of Alkyl-Imidazolium Salts and Their Application in Nanocomposites <i>W. H. Awad, J. W. Gilman, M. Nyden, R. Davis, R. H. Harris Jr., T. E. Sutto, J. H. Callahan, H. C. Delong, and P. C. Trulove</i> | 200 |
|--|-----|

| | |
|---|-----|
| Transition Metal Catalyzed CO/Olefin Co- Polymerization in Room Temperature Ionic Liquids <i>J. D. Holbrey, K. H. Shaughnessy, M. A. Klingshirn, G. A. Broker, and R. D. Rogers</i> | 213 |
|---|-----|

| | |
|---|-----|
| Catalytic Oxidation and Comparative Kinetics in Room-Temperature Ionic Liquids <i>M. M. Abu-Omar, G. S. Owens, and A. Durazo</i> | 224 |
|---|-----|

| | |
|--|-----|
| Bioelectrocatalytic Reactions in Room-Temperature Ionic Liquids <i>D. L. Compton and J. A. Laszlo</i> | 234 |
|--|-----|

| | |
|---|-----|
| Solvatochromic Probe Behavior within Neat and Cosolvent added Room-Temperature Ionic Liquid Solutions <i>K. A. Fletcher and S. Pandey</i> | 244 |
|---|-----|

| | |
|---|-----|
| Ionic Liquids from Biorenewable Resources: Nicotine and Fructose <i>S. T. Handy, M. Okello, C. Egrie, and G. Dickenson</i> | 257 |
| Nonenzymatic Synthesis of Peptides in an Ionic Liquid <i>V. F. Smith, H. C. De Long, T. E. Sutto, and P. C. Trulove</i> | 268 |
| The oxidation of Alcohols Using Ruthenium Catalysts and Imidazolium Ionic Liquids <i>V. Farmer and T. Welton</i> | 276 |
| Palladium Catalyzed Suzuki Cross-Coupling Reactions in Ambient-Temperature Ionic Liquids <i>C. J. Mathews, P. J. Smith, and T. Welton</i> | 286 |
| Room-Temperature Ionic Liquids for Synthesis of Advanced Materials <i>S. Dai, C. -Y. Yuan, B. Lee, C. Liang, R. D. Makote, and H. Luo</i> | 295 |

High Temperature Molten Salts

| | |
|--|-----|
| Molten Salt Oxidation: A Rassessment of its Supposed Catalytic Mechanism and Hence its Development for the Disposal of Waste Automotive Tires <i>T. R. Griffiths, V. A. Volkovich, and E. M. Anghel</i> | 306 |
| Molten Salt Electrocatalytical Membrane Cells for Flue Gas Cleaning <i>S. B. Rasmussen, K. M. Eriksen, J. Winnick, P. Simonsen, and R. Fehrmann</i> | 318 |
| <i>In-Situ</i> Raman Spectroscopic Study of Supported Molten Salt Catalysts During SO ₂ Oxidation <i>I. Giakoumelou, R. M. Caraba, V. Parvulescu, and S. Boghosian</i> | 325 |
| Raman Spectroscopic Measurements and Molecular Dynamic Simulation of Three-Dimensional Anionic Structures of Molten Al ₂ O ₃ -Na ₂ O-SiO ₂ System <i>Y. Sasaki, M. Mohri, and K. Ishii</i> | 337 |
| Electrical Conductivity and Transference Number Measurements of FeO - CaO - MgO - SiO ₂ Melts <i>A. Ducret, D. Khetpal, and D. R. Sadoway</i> | 347 |
| Lewis Acid-Base Equilibrium Effects on the Volatility of Aluminum and Gallium Trichlorides in Molten NaCl-AlCl ₃ -GaCl ₃ Mixtures and on the Ga/Al Separation Factor <i>A. B. Salyulev, A. L. Bovet, and N. I. Moskalenko</i> | 354 |
| Molten Salt electrolysis for the Recycling of Pulping Chemicals <i>R. Wartena, J. Winnick, and P. H. Pfromm</i> | 366 |

| | |
|--|-----|
| Thermodynamics of the Formation of Gallium Chlorides in the LiCl-KCl-CsCl Eutectic Melt <i>A. L. Bovet, V. V. Smolensky, V. S. Mityaev, and N. P. Borodina</i> | 380 |
| Low-Melting Salt Mixtures Data: Errors in Concentration Coordinates <i>V. I. Lutsyk</i> | 386 |
| A New Model of the Electric Double Layer at Electrodes in Molten Salts <i>A. Kizza</i> | 399 |
| Towards Elimination of the Anode Effect and Perfluorocarbon Emissions from Hall-Heroult Cells <i>H. Zhu and D. R. Sadoway</i> | 411 |
| Measurement and Modeling of the Alumina Solubility in Cryolite Melts at 1300K <i>Y. Zhang and R. A. Rapp</i> | 419 |
| Redox Potential of Novel Electrochemical Buffers Useful for Corrosion Prevention in Molten Fluorides <i>G. D. Del Cul, D. F. Williams, L. M. Toth, and J. Caja</i> | 431 |
| Corrosion and Vapor Transport Involving Novel Manganese Oxo-Species: the Characterization of Molecular Cs ₂ MnO ₄ by Mass Spectrometry and Matrix Isolation IR Spectroscopy <i>B. Farrow, R. A. Gomme, and J. S. Ogden</i> | 437 |
| Model Structures of Alkali Metal Chloride Melts <i>V. G. Kremenetsky</i> | 448 |
| Relationship Between Electrical Conductivity and Thermodynamic Properties of Binary Molten Salt Mixtures <i>A. Redkin</i> | 453 |
| Investigation of the Kinetics of Electrode Processes in Halide Melts Containing Beryllium, Vanadium, Niobium and Hafnium <i>O. I. Rebrin, R. Yu. Scherbakov, I. B. Polovov, S. M. Mihalev, V. A. Volkovich, A. S. Muhamadeev, and B. D. Vasin</i> | 460 |
| Raman Spectra of Liquid Sulfur Around the Polymerization Transition and in the Glassy State <i>A. G. Kalampounias, G. N. Papatheodorou, and S. N. Yannopoulos</i> | 473 |
| Raman Spectroscopic Measurements of Molten Ceramic Materials at High Temperature <i>A. G. Kalampounias and G. N. Papatheodorou</i> | 485 |
| Spectra and Structure of Pt (II) Complexes in Carbamide and Carbamide-Halide Melts <i>N. I. Buryak, T. A. Silinskaya, N. KH. Tumanova, and S. V. Volkov</i> | 494 |

Lanthanide, Actinide, and Radioisotope Chemistry in Molten Salts

| | |
|---|-----|
| Investigation of Uranium in Bis(trifluoromethylsulfonyl)imide Based Ionic Liquids <i>D. A. Costa, W. J. Oldham, and R. Chavarria</i> | 500 |
| About Possible Use of Low-Temperature Melts for Plutonium Alloy Conversion to Pellet MOX-fuel <i>A. G. Ossipenko, V. N. Syuzyov, V. A. Stupin, and A. V. Bychkov</i> | 508 |
| Actinide Chemistry in Novel Solvent Media: Room-Temperature Ionic Liquids <i>A. E. Visser and R. D. Rogers</i> | 516 |
| Electrotransport of U and Pu into Liquid Cadmium Cathodes in LiCl-KCl Eutectic Melts <i>K. Uozumi, M. Iizuka, T. Inoue, O. Shirai, T. Iwai, and Y. Arai</i> | 530 |
| Anodic Process of Electrorefining Spent Nuclear Fuel in Molten LiCl-KCl- UCl_3 /Cd System <i>S. X. Li</i> | 541 |
| Actinides Recycle by Pyrometallurgy in Nuclear Fuel Cycle <i>T. Inoue, Y. Sakamura, M. Iizuka, K. Kinoshita, T. Usami, M. Kurata, and T. Yokoo</i> | 553 |
| Separation of Uranium and Magnesium by Molten Salt Electrorefining <i>B. Mishra, I. Maroef, and D. Hebditch</i> | 563 |
| Influence of the First and Second Coordination Spheres on Electrochemical and Thermodynamic Properties in Alkali Chloride Melts <i>S. A. Kuznetsov and M. Gaune-Escard</i> | 576 |
| Nano-Materials from Molten Salts: Preparation of Nano-Sized Lanthanide Phosphates from Chloride Melts <i>V. A. Volkovich, T. R. Griffiths, and R. C. Thied</i> | 590 |
| Mixing Enthalpies of $TbBr_3$ -MBr Liquid Mixtures (M=Li, Na, K, Rb, Cs) <i>L. Rycerz and M. Gaune-Escard</i> | 603 |
| Infrared Radiation Spectra of Oxyhydril Groups in MCl (M = Na, K, Cs) and UO_2Cl_2 -CsCl Mixed Melts <i>A. A. Khokhryakov and A. M. Khokhlova</i> | 611 |
| Joint Electroreduction of Lanthanum, Gadolinium and Boron in Chloride Melts <i>H. B. Kushkhov, M. K. Vindizheva, A. S. Uzdenova, and Z. A. Zhanikaeva</i> | 616 |

| | |
|---|-----|
| Hafnium in Molten Salts: Electrochemistry, Chemistry, Electrodeposition <i>S. A. Kuznetsov and S. V. Kuznetsova</i> | 622 |
| Electrochemical Behavior of Some Lanthanides in Imide Room-Temperature Molten Salt Systems <i>M. Yamagata, Y. Katayama, and T. Miura</i> | 640 |
| Electrodeposition in Molten Salts | |
| Electrodeposition of Titanium-Aluminum Alloys in the Lewis Acidic Aluminum Chloride-1-Ethyl-3-Methylimidazolium Chloride Molten Salt <i>T. Tsuda and C. L. Hussey, and G. R. Stafford</i> | 650 |
| STM Study of 2D and 3D Phase Formation of Ni and Ni-Al Alloys during Electrodeposition from a Chloroaluminate Molten Salt <i>C. A. Zell and W. Freyland</i> | 660 |
| Electrodeposition of Al-Mg Alloys from Lewis Acidic AlCl ₃ -EMIC-MgCl ₂ Room-Temperature Molten Salts <i>M. Morimitsu, N. Tanaka, and M. Matsunaga</i> | 671 |
| The Electrodeposition of Germanium from an Ionic Liquid: a Mini-Review on the Nanoscale Processes <i>F. Endres</i> | 677 |
| Conductivity and Electrochemistry of Cobalt (II) and Dysprosium Chloride in Zinc Chloride-1-Ethyl-3-Methyl-Imidazolium Chloride Room-Temperature Molten Salt <i>H. -Y. Hsu and C. -C. Yang</i> | 690 |
| Construction Principle of Complex Electrochemical Synthesis (ES) Diagrams on the Example of the Ti-B System <i>G. Kaptay</i> | 700 |
| The Electrochemistry of Tin in the Zinc Chloride- 1-Ethyl-3-Methylimidazolium Chloride Ionic Liquids <i>J. -F. Huang and I-W. Sun</i> | 713 |
| High Temperature Oxidation Behavior of TiAl Coated by Al-Cr Alloy in Molten Salt <i>M. Ueda, D. Susukida, S. Konda, and T. Ohtsuka</i> | 724 |
| Preparation of a High-Surface-Area Nickel Electrode in a ZnCl ₂ -NaCl Melt <i>A. Katagiri and M. Nakata</i> | 734 |
| Production of Aluminium, Magnesium and Aluminium-Magnesium Alloys by Direct Electrochemical Reduction of Their Solid Oxides <i>A. Cox and D. J. Fray</i> | 745 |

| | |
|--|-----|
| Production of Reactive Metals by Molten Salt Processing <i>B. Mishra and D. L. Olson</i> | 758 |
| Electrowinning of Metallic Lithium from Molten Salts <i>Y. Sato, Y. Qin, Z. Zheng, T. Kobayashi, and T. Yamamura</i> | 771 |
| Electrorefining of Magnesium in Chloride Melts <i>T. Takenaka, S. Isazawa, Y. Naka, and M. Kawakami</i> | 779 |
| Formation of Metal Fog and Dissolved Metals During Electrodeposition from Molten Salts <i>G. M. Haarberg</i> | 789 |
| Electrodeposition of Refractory Metals from Molten Salts <i>E. Boland, R. Lanam, A. Shchetkovskiy, and A. Smirnov</i> | 797 |
| Electroless Coating of Non-Conducting Surfaces and Particles with Metallic Titanium in Molten Salts <i>J. Sytchev, Zs. H. Göndör, and G. Kaptay</i> | 803 |
| A New Concept of Sponge Titanium Production by Calciothermic Reduction of Titanium Oxide in the Molten CaCl ₂ <i>R. O. Suzuki and K. Ono</i> | 810 |
| Investigation of the Mechanism of the Joint Electrodeposition of Dimolibdenate, Ditungstate (Mo ₂ O ₇ ²⁻ , W ₂ O ₇ ²⁻)-Ions and Carbon Dioxide (CO ₂) in Sodium Tungstate Melt <i>H. B. Kushkhov, L. M. Beroeva, and M. N. Adamokova</i> | 822 |
| Joint Electrodeposition of Molybdenum, Tungsten and Molybdenum-Tungsten Alloys from Oxy-Halide Melts <i>H. B. Kushkhov, L. M. Beroeva, and R. A. Karashaeva</i> | 831 |
| Electrorefining of Aluminum in C ₆ mimCl + AlCl ₃ ionic Liquid At near Room Temperature <i>V. Kamavaram and R. G. Reddy</i> | 840 |
| Cathode Bottom Wear During Aluminum Electrolysis <i>H. A. Øye, X. Liao, A. Støre, and T. Foosnæs</i> | 847 |
| Study of the Morphology of TiB ₂ Coatings on Molybdenum Substrates Electrodeposited from a NaCl-KCl-K ₂ TiF ₆ -NaF-NaBF ₄ Melt at 700°C <i>M. F. Souto, J. Sytchev, A. Köpf, R. Krendelsberger, G. E. Nauer, and G. Kaptay</i> | 857 |
| Electrodeposition of Zinc from Lewis Basic 1-Ethyl-3-Methylimidazolium Bromide-Zinc Bromide Molten Salt <i>H. Yamamoto, T. Iwagishi, K. Koyama, H. Shirai, and H. Kobayashi</i> | 863 |

Electrochemical Deposition of Aluminum at Vitreous Carbon in a Room-Temperature Molten Salt
G. T. Cheek..... 873

Electrochemistry and Methods for the Electropolishing of Refractory Metals in Low-Temperature Carbamide Containing Melts
S. Kochetova, L. Bogdanovich, and N. Tumanova..... 881

Electrochemistry and Properties of Room-Temperature Molten Salts

Electrochemical Investigations in the Ionic Liquid 1-Butyl-3-Methylimidazolium Hexafluorophosphate
D. L. Boxall, J. J. O'Dea, and R. A. Osteryoung..... 889

Electrochemistry in Ionic Liquids
C. A. Brooks and A. P. Doherty..... 900

Electrochemistry of 1-Butyl-3-Methyl-1*H*-Imidazolium Tetrafluoroborate Ionic Liquid
L. Xiao and K. E. Johnson..... 910

Electrochemical Studies of the Fries Rearrangement in a Room-Temperature Molten Salt
G. T. Cheek..... 923

Electrochemistry of Ta(V) in Lewis Basic TaCl₅-EMIC Low Temperature Molten Salts
M. Matsunaga, T. Matsuo, and M. Morimitsu..... 931

Electrolytic Synthesis of Perfluorotrimethylamine with Alkali Metal Fluoride Contained Carbon Anode
A. Tasaka, A. Miyasaka, T. Miyazaki, H. Takebayashi, T. Tojo, and K. Momota..... 937

Analysis of the Species in the (CH₃)₄NF·*m*HF Melt and Electrolysis of its Melt with LiNiO₂ Coated Ni Anode
Y. Shodai, K. Momota, and A. Tasaka..... 946

Electrical Conductivity of Coexisting System Containing Inorganic Powder and Ambient-Temperature Molten Salts
M. Mizuhata, K. Yaso, A. Kajinami, and S. Deki..... 954

The Molarities of Ionic Liquid Species — Densities are not Boring
L. Xiao, J. S. Wilkes, and K. E. Johnson..... 964

| | |
|--|------|
| NMR Relaxation Studies and Molecular Modeling of 1-butyl-3-methylimidazolium PF ₆ [BMIM][PF ₆] <i>W. R. Carper, Z. Meng, P. Wasserscheid, and A. Dölle</i> | 973 |
| Coordination Chemistry and Speciation of Metal Complexes in Room-Temperature Ionic Liquids <i>W. J. Oldham and D. B. Williams</i> | 983 |
| Quantitative Study by Raman Spectroscopy of the Stability of 1-Methyl-3- Butylimidazolium Chloride/AlCl ₃ /EthylAlCl ₂ Mixed Molten Salts in Presence of an Aliphatic Hydrocarbon <i>B. Gilbert, S. Dechamps, and H. Olivier</i> | 991 |
| The HNMR Spectra of Molten Asymmetric Pyridinium Salts <i>D. S. Newman, D. Y. Chen, V. A. Oliveira, A. M. Elias, and M. E. Elias</i> | 999 |
| Alkylimidazolium Fluorohydrogenates Room Temperature Molten Salts <i>R. Hagiwara, K. Matsumoto, Y. Nakamori, T. Tsuda, Y. Ito, H. Matsumoto, and K. Momota</i> | 1007 |
| Physicochemical Properties of Pyrazolium Based Ionic Liquid 1-Ethyl-2-Methylpyrazolium Tetrafluoroborate <i>J. Caja, T. D. J. Dunstan, and V. Katovic</i> | 1014 |
| Conductivities of Room Temperature Molten Salts Containing ZnCl ₂ , Measured by a Computerized Direct Current Method <i>H. -Y. Hsu and C. -C. Yang</i> | 1024 |
| Investigation of Physical Properties for a New Type Molten ZnCl ₂ -DMSO ₂ Electrolytes <i>M. -F. Shu and C. -C. Yang</i> | 1036 |
| High-energy X-ray Diffraction Studies of Alkylimidazolium Fluorohydrogenate Room-Temperature Molten Salts at Spring-8 High-Energy X-ray Diffraction Beamline BL04B2 <i>S. Kohara, R. Hagiwara, K. Matsumoto, Y. Ito, A. Kajinami, and K. Suzuya</i> | 1047 |
| Physical and Electrochemical Properties of Room Temperature Molten Salt Based on Aliphatic Onium Cations and Asymmetric Amide Anion <i>H. Matsumoto, H. Kageyama, and Y. Miyazaki</i> | 1057 |
| AUTHOR INDEX | 1066 |
| SUBJECT INDEX | 1070 |