

International Society of Electrochemistry
Academy of Sciences of Republic Georgia
Georgian Technical University

P R O G R A M M E

FIRST R. AGLADZE INTERNATIONAL SYMPOSIUM

ON

ELECTROCHEMISTRY OF MANGANESE

&

International Seminar on Instrumental Methods of
Study of Electrochemical & Corrosion Processes



Republic Georgia
Tbilisi

24 - 27 September, 1991

Welcome Addresses

9-30 a.m.

A. Tavkhelidze
President of Georgian
Academy of Sciences
Tbilisi (RG)

K. Heusler
Chairman of ISE Division
Corrosion, Electrodeposition
and Electrochemical Engineering"
Klaushal (GFR)

Ya. Kolotyarkin
Chairman of Scientific
Council on Electrochemistry
and Corrosion, Academy
of Sciences
Moscow (USSR)

G. Chogovadze
Rector of the Georgian
Technical University
Tbilisi (RG)

PLENARY SESSION

10-10 a.m. 0-01 L. Japaridze (RG)
Academician R. Agladze - the
founder of electrochemical
science and technology
in Georgia

10-45 p.m. 0-02 R. Kvaratskheliya (RG)
Contribution of R. Agladze
and his school to the electro-
chemistry and electrochemi-
cal technology

11-00 p.m. 0-03 T. Agladze (RG)
New technologies for elect-
rosynthesis of manganese
compounds and electrodeposi-
tion of manganese and manga-
nese composites

11-30 - 11-45 a.m. Coffee break

KEYNOTE LECTURES & ORAL PRESENTATIONS

Topic I, Hall A

**Manganese materials for energy sources &
energy sources with manganese materials**

11-45 a.m. 1-01 K. Heusler (GFR), KN
The Mechanism of the Mangan-
ese Dioxide Electrode

12-15 a.m. 1-02 J. Fernandez (India)
Structure of Manganese Dio-
xide: A Review of the Pre-
sent State of Knowledge

12-45 p.m. 1-03 X. Domenech (Spain)
Photocatalytic Oxidation of
Mn(II)

1-15 - 3-00 p.m. Lunch

3-00 p.m. 1-04 Xia Xi (China), KN
Studies on Methods of
Modified Manganese
Dioxide

- 3-30 p.m. 1-05 G. Tsagareli, L. Japaridze, D. Jikiya, Sh. Makhatadze (RG), KN
Mechanism and Kinetics of Manganese Dioxide Electrodeposition on the Surface of Platinum and MnO_2
- 4-00 p.m. 1-06 P. Gogoladze, T. Agladze (RG)
On the Mechanism of Electrolytic Manganese Dioxide
- 4-30 - 4-45 p.m. Coffee break
- 4-45 p.m. 1-07 Ph. Touzain (France)
Electrochemical Reduction of Manganese Chloride-graphite Intercalation Compounds
- 5-15 p.m. 1-08 N. Ilchev (Bulgaria), KN
Physicochemical and Electrochemical Characteristics of Different Manganese Dioxides in Non-aqueous Electrolytes
- 5-45 p.m. 1-09 K. Tikhonov, B. Ravdel (USSR)
Thermodynamics and Kinetics of Manganese Dioxide Electrode in Aprotic Organic Solvents

KEYNOTE LECTURES & ORAL PRESENTATIONS

Topic II, Hall B

Electrodeposition of Manganese, Manganese Alloys and Composite Coatings

- 4-45 p.m. 2-01 V. Kublanovski (USSR), KN
Mechanism of Manganese Ions Discharge from Sulphate Electrolytes
- 5-15 p.m. 2-02 P. Ilea (Romania)
Linear Sweep Voltammetry in the System $(NH_4)_2SO_4 - MnSO_4$
- 5-45 p.m. 2-03 F. Danilov, D. Sukhomlin (USSR)
Electrodeposition of Coatings by Zinc-Manganese Alloy and Their Corrosion Properties.
- 6-15 p.m. 2-04 G. Znamenski, I. Tsisar (USSR)
Composite Electrochemical Coatings on the Base of Manganese Alloys
- 6-45 p.m. 2-05 [A. Rotinian], B. Karbasov, L. Ustinenkova (USSR)
Utilisation of Manganese Redox Reactions for Creation of Wasteless Galvanic Technologies

POSTER SESSION

Topic I, Corridor A

- | | | | |
|------|---|------|--|
| 1-20 | T. Japaridze, M. Tarasevich (USSR)
Electrochemical Activity of MnO_2 in Aqueous and Acetonitrilic Solutions and its Dependence on Specific Surface and Porosity of Different MnO_2 Samples | 1-27 | E. Kachibaya (RG)
Manganese and Chromium Separate and Mixed Oxides as Cathodic Materials for Lithium Current Sources |
| 1-21 | T. Lejava (RG)
Effect of Ionizing Radiation on Physico-chemical Properties of Manganese Dioxide. | 1-28 | A. Krasnobrishi A. Kojevnikov (USSR)
Utilization of Manganese Dioxide as a Cathodic Material for Lithium Current Sources |
| 1-22 | S. Oleinikov (USSR)
Electrochemical Properties of Manganese Dioxide in Aprotic Electrolytes | 1-29 | N. Lagidze (RG)
Aspects of Ion Exchange Compounds Utilization in Chemical Current Sources |
| 1-23 | V. Nepochatov (USSR)
Physiko-chemical Studies of Manganese Dioxide | 1-30 | S. Volkov, N. Buriak, O. Babushkina, V. Bandur (USSR)
Manganese (II) as Coordination Probe of Electronic and Geometric Structure of Various Salt Melts |
| 1-24 | E. Shkolnikov (USSR)
Porous Structure and Reactivity of Manganese Dioxide | 1-31 | L. Bokuchava, D. Jincharadze (RG), Chen Shouai, Li Qilong (China)
Determination of Manganese, Copper, Lead and Cadmium Traces in Mineral Waters by Adsorptive Complex Wave |
| 1-25 | Sh. Makhatadze, G. Tsagareli (RG)
Electrodeposited Manganese Dioxide in Neutral and Acid Media | 1-32 | G. Gordadze, A. Gordadze, V. Lejava, L. Machavariani, G. Svanidze (RG)
Study of Elements Content in Manganese Ores and Ferromanganese Concretions by Means of Neirone Activation Analysis |
| 1-26 | Xia Xi (China)
On the Rechargeability of Manganese Dioxide. | | |

- 1-33 G. Kharashvili, R. Demetrashvili, T. Agladze (RG)
Coulometric Approach for Active Chlorine and Oxygen Determination in Inorganic Oxidizers
- 1-34 G. Kharashvili, R. Demetrashvili, T. Agladze (RG)
Automatic Coulometric Analyser of Manganese Oxidizers
- 1-35 E. Babak (USSR)
Behaviour of Faradic Impedance at High Frequency Alternating Current
- 1-36 G. Gordadze, E. Gabedava, K. Sigua (RG)
Selection of Optimal Radiometric Methodics for Alloys Dissolution Partial Velocities Measurement

Topic II, Foyer

Electrodeposition of Manganese, Manganese Alloys and Composite Coatings

- 2-06 I. Shavoshvili, N. Kervalishvili, T. Agladze (RG)
Electrodeposition of Hard Manganese Composite Coatings
- 2-07 I. Shavoshvili, T. Lomiya, T. Agladze (RG)
Black Manganese Selective Coatings for Solar Energy Panels

- 2-08 O. Sadunishvili, N. Gofman, E. Kabzinadze, I. Gvaliya (RG)
Effect of Hydride Formation on Manganese Electrocrystallization
- 2-09 M. Batsikadze, T. Agladze, G. Broladze, D. Popova, R. Kiseleva (RG)
Production and Study of Ultradispersed Powders of Manganese and Manganese Compounds
- 2-10 A. Avaliani (RG)
Electrodeposition of Manganese on Liquid Cadmium Cathode

KEYNOTE LECTURES & ORAL PRESENTATIONS

Topic I, Hall A

Manganese materials for energy sources & energy sources with manganese materials

- 9-00 a.m. 1-10 K. Kordesch (Austria), KN
The Technology of the Rechargeable Alkaline Zinc - Manganese Dioxide Battery: From Research and Development to Production
- 9-30 a.m. 1-11 M. Tarasevich (USSR), KN
Mass - Transport in Laccanshe and Alkaline Mn-Zn Cells
- 10-00 a.m. 1-12 Xia Xi (China),
Recent Aspects of Zn/MnO₂ Batteries of China
- 10-30 a.m. 1-13 A. Gorodiski (USSR)
The Effects of Ionic Conductance and Complex Formation on Characteristics of Manganese Dioxide Batteries
- 11-00 a.m. 1-14 B. Desai (India)
Discharged Characteristics of Doped (beta)-MnO₂ in H₂SO₄ and ZnCl₂ electrolytes
- 11-30 - 11-45 a.m. Coffee break

- 11-45 a.m. 1-15 B. Efremov, S. Orlov (USSR)
Principles of Progress in New Mn-Zn Soviet Cells
- 12-15 a.m. 1-16 C-C. Bolla (Romania)
Thermal Modified EMD for Lithium Batteries
- 1-15 - 3-00 p.m. Lunch
- 3-00 p.m. 1-17 N. Kamegashira, H. Satoh, S. Suzuki (Japan), KN
Thermodynamic Stability of LnMn₂O₅ Phase (Ln = rare earths)
- 3-30 p.m. 1-18 A. Neumin (USSR), KN
Manganates of Rare Earth Elements as Electrodes in Electrochemical Devices with Solid Electrolytes
- 4-00 p.m. 1-19 E. Kuzminski (USSR)
Combined Electrodes on the Base of Manganese Dioxide for Energy Conversion Systems
- 4-30 - 4-45 p.m. Coffee break

KEYNOTE LECTURES & ORAL PRESENTATIONS

Topic III, Hall B

Hydroelectrometallurgy of Manganese and Manganese Dioxide

- 9-00 a.m. 3-01 N. Nankov (Bulgaria), KN
Complex Wasteless Technology For Processing
of Manganese Carbonate
Ores
- 9-30 a.m. 3-02 L. Bobes- Rodriguez (Cuba)
Production of Electrolytic
Manganese Dioxide
From Cuban Ores
- 10-00 a.m. 3-03 I. Kisil (USSR)
The EMD Production Technology
- 10-30 a.m. 3-04 R. Agladze, V. Mindin,
N. Kiknadze (RG)
Physico-chemical Processing of Manganese and
Halkopirite Concentrates
- 11-00 a.m. 3-05 V. Dashevski, V. Kashin
(USSR)
Low Phosphorus Manganese
Ferro-alloys Production
from Concentrates of
Chemical Enrichment
- 11-30 - 11-45 a.m. Coffee break

- 11-45 a.m. 3-06 L. Japaridze, T. Chakhu
nashvili, J. Keadze,
T. Rokva, E. Kalinovski,
G. Tsagareli, E. Bogdanov (RG)
Titanium Anode with Active Layer for Electrolytic
Manganese Dioxide Production
- 12-15 a.m. 3-07 J. Shengeliya (RG), KN
Technology for Electrolytic Manganese and
Manganese Dioxide by Indirect Electrochemical
Leaching of Carbonate
and Mixed Ores

POSTER SESSION

Topic III, Corridor A

Hydroelectrometallurgy of Manganese and Manganese Dioxide

- 3-08 V. Gaprindashvili (RG)
Copper Sulphide and Oxidized
Manganese Concentrates Hydrometallurgical Simultaneous Processing
- 3-09 G. Agladze, T. Lejava, E. Chichinadze, H. Gogichaishvili (RG)
Nitrate Processing of Permanganate and Manganate Solutions

- 3-10 N. Gogishvili, J. Abuladze,
N. Demuriya (RG)
Simultaneous Obtaining of Man-
ganese Products on Anode and
Cathode
- 3-11 N. Shaliakina, S. Nikitin,
S. Delibashvili, I. Gvaliya,
B. Tugushi, N. Bogveradze,
D. Nebieridze, T. Agladze
J. Shengeliya, (RG)
Application of Soluble Anodes
in Nondirect Electrochemical
Leaching of Low Grade Manganese
Concentrates
- 3-12 N. Shaliakina, S. Delibashvili,
S. Nikitin, I. Javakhadze,
K. Okruashvili, T. Agladze
J. Shengeliya (RG)
Intensification of Simultaneous
Electrochemical Leaching of
Manganese Concentrates and
Slimes and Electrolytic Mangan-
ese Dioxide Production Tech-
nologies
- 3-13 T. Rokhva, L. Japaridze,
T. Tshakhunashvili, M. Asaturi-
ani (RG)
Development of Electrolysis and
Electrodes for Highly Dispersed
Electrolytic Manganese Dioxide
Production
- 3-14 Z. Kervalishvili, T. Tepnadze,
T. Agladze, J. Shengeliya,
S. Nikitin (RG)
Pilot Plant for Manganese Dio-
xide Production by Using Indirect
Electrochemical Leaching
- 3-15 J. Shengeliya, I. Kakhniashvili (RG)
Simultaneous Electrochemical
Processing of Copper and Mangan-
ese Concentrates in Nitrogen
Acid Solutions
- 3-16 A. Shkurov, A. Kataev (USSR)
Feasibility Study of EMD Produ-
ction Shop Reconstruction at
Rustavi Production Union Azot
- 3-17 T. Tshakhunashvili, D. Japari-
dze, T. Mestvrishvili E. Bogda-
nov, L. Shaduri, E. Abashidze,
R. Daneliya, A. Ogadjanova (RG)
Perspectives of Wasteless and
Environmentally Clean Electro-
lytic Manganese Dioxide Produc-
tion in Georgia
- 3-18 T. Tshakhunashvili, L. Japari-
dze, J. Keadze, T. Gogichaish-
vili (RG)
Aspects of Cathodic Materials
in Electrolytic Manganese Dio-
xide Production
- 3-19 E. Kalinovski (USSR)
Stable Titanium - Manganese
Dioxide Anode for Electrolysis
of Aqueous Solutions
- 3-20 E. Kalinovski, G. Keadze,
L. Kakuriya, I. Rosinski (USSR)
Obtaining of Electrolytic Man-
ganese Dioxide on Titanium -
Manganese Dioxide Anode

- 3-21 V. Smirnov, M. Smirnova,
J. Bepalova (USSR)
Manganese Dioxide Anodes in
Electrosynthesis of Organic
Compounds
- 3-22 K. Vanidze, L. Zautashvili,
T. Agladze (RG)
Five Years Experience of Maintenance of DSA Ti-Mn Anodes for Electrolytic Manganese Dioxide Production
- 3-23 O. Slusarenko (USSR)
Testing of Metaloxide Composite Anodes, Not Containing Noble Metals, in EMD-2 Production
- 3-24 O. Sadunishvili, N. Gofman,
I. Gvaliya (RG)
Study of Manganese Production from Indian Manganese Ores of Dongri Buzung and Chikla Mines
- 3-25 B. Bairachni, L. Liashok,
V. Bairachni, L. Kravtsov (USSR)
Electrosynthesis and Properties of the System Metal (Nb, Ta, Ti, Cr) - Manganese Dioxide in Electronics and Electroplating
- 3-26 L. Gvasaliya, R. Shekhlashvili (RG)
Production of Active Catalysts from Permanganate Wastes

Topic IV, Foyer

Physico-chemical and Corrosion Properties of Manganese Materials

- 4-09 T. Markova, L. Freiman (USSR)
The Effect of Manganese Sulfides on Electrochemical Behaviour of Ferrite Stainless Steels in Weak Acidic Chlorine Media
- 4-10 N. Kervalishvili, T. Agladze (RG)
Efficiency of Manganese Sacrificers in Solutions with Different pH
- 4-11 Z. Kemkhadze, N. Gogua, T. Kemkhadze (RG)
Coatings with Antimarine Growth Properties
- 4-12 A. Sarukhanishvili (RG)
Peculiarities and Utilization of Manganese Containing Glasses
- 4-13 V. Grabovski (USSR)
Behaviour of Mild Steels in Fertilizers Media

Topic V, Foyer

Electrosynthesis of Manganese Compounds

- 5-06 G. Tsurtsuniya, M. Tshankashvili, L. Kareli, T. Agladze (RG)
Indirect Electrochemical Synthesis of Manganese Cyclopentadiene Complexes

- 5-07 M. Grdzeliashvili, L. Gotiashvili, A. Avaliani (RG)
Manganese Acid and Manganese Ammonia Production by Electro-synthesis and Electrodialysis
- 5-08 V. Kveselava, G. Agladze, A. Sharachiyan (RG)
Study of the Precipitates Formed from Alkaline Solutions of Potassium Permanganate Electro-synthesis

KEYNOTE LECTURES & ORAL PRESENTATIONS

Topic IV, Hall B

Physico-chemical and Corrosion Properties of Manganese Materials

- 9-00 a.m. 4-01 R. Newman (UK), KN
K. Sieradzki (USA),
De-alloying of Manganese
from Solid Solution Al-
loys
- 9-30 a.m. 4-02 L. Freiman (USSR), KN
Role of Manganese Sulfides
in Corrosion Stability of
Stainless Steels
- 10-00 a.m. 4-03 N. Pakhomova, I. Glotova (USSR)
The Effect of Manganese
as an Additive on the
Corrosion Resistance of
High silica Stainless
Steels in Nitric Acid
- 10-30 a.m. 4-04 F. Danilov, A. Velichenko (USSR)
Corrosion-electrochemical
Behaviour of Titanium -
Manganese Dioxide
Anodes in Reducing Electrolytes
- 11-00 a.m. 4-05 Meng Xiang Fa (China),
Z. Rotenberg, T. Agladze
(USSR)
Electrochemical Peculiarities
of Titanium -
Manganese Anodes

11-30 - 11-45 a.m. Coffee break

11-45 a.m. 4-06 S. Hagstrom (USA), KN
Ultrathin Magnetic Films

12-15 a.m. 4-07 J. Tibballs (Norway)
Manganese in Aluminium
and Magnesium Alloys - A
Thermochemical Assessment

12-45 a.m. 4-08 M. Jantashvili, G. Mchedlishvili (RG)
Electrochemical Formation
of Manganese Containing
Ferrites

1-15 - 3-00 p.m. Lunch

Topic V, Hall A

Electrosynthesis of Manganese Compounds

- 09-00 a.m. 5-01 G. Agladze (RG), KN
Electrosynthesis of Manganese
Containing Oxidizers
- 9-30 a.m. 5-02 N. Feodorovitch (USSR)
Mechanism of Electroreduction
of Permanganate-anion
- 10-00 a.m. 5-03 G. Carriedo (Spain), KN
Chemical and Electrochemical
Oxidation of Mono and Binuclear
Manganese Carbonyl Complexes

10-30 a.m. 5-04 L. Bugaenko (USSR)
Electrochemical Formation
of Manganese (III) at
Carbon Containing Electrodes

11-00 a.m. 5-05 G. Tsintsadze (RG)
Crystallochemical Peculiarities
of Manganese (II) Coordination
Compounds with Some Oxygen
and Nitrogen Substituted
Bioactive Ligands

11-30 - 11-45 a.m. Coffee break

SEMINAR

Instrumental Methods of Study of Electrochemical and Corrosion Processes

Electrochemistry

Hall B

3-00 p.m. Se-1 M. Fleischman (UK)
Electrochemistry at the
Molecular Layer

3-30 p.m. Se-2 R. Armstrong (UK)
A.C. Impedance Methods for
the Study of Polymer Films

4-00 p.m. Se-3 T. Marsagishvili (RG)
Radioactive Radiation in
Electrochemical Systems

4-30 - 4-45 p.m. Coffee break

4-45 p.m. Se-4 J. Japaridze, M. Hohashvili (RG)
Possibilities of Electromagnetic Radiation in Interfacial Adsorption Studies

5-15 p.m. Se-5 K. Heusler (GFR)
Electrochemical Uses of the Quartz Oscillator

5-45 p.m. Se-6 S. Martemianov, B. Grafov (USSR)
Turbulent Mass-transport in Electrochemical Systems

6-15 p.m. Se-7 Li Qilong (China)
Adsorptive Complex Wave and its Application

6-45 p.m. Se-8 V. Mindin (RG)
Computerised Chemistry Solves Problems of Applied Chemistry

Corrosion

Hall A

- 11-45 a.m.Sc-1 K. Heusler (GFR)
Measurement of Intrinsic
Electrochemical Noise
- 12-15 a.m.Sc-2 A. Grzegorzewski (GFR)
Simultaneous Measurement
of Time Resolved Reflecti-
on Spectra, Mass and Sur-
face Stress at Passivating
Films
- 12-45 p.m.Sc-3 T. Agladze (RG)
New Instrumental Approach
to Predicting of Suscepti-
bility of Metal materials
to SCC and Corrosion
Fatigue
- 1-15 - 3-00 p.m. Lunch
- 3-00 p.m.Sc-4 L. Kiss (Hungary)
Multistep Dissolution of
Metals
- 3-30 p.m.Sc-5 V. Filinovski (USSR)
Simulation of Corrosion
Fatigue on Rotating Disk
Electrode
- 4-00 p.m.Sc-6 R. Lazorenko-Manevich,
L. Sokolova (USSR)
Adsorption Mechanism of
Passive Metal Electroref-
lectance

4-30 - 4-45 p.m. Coffee break

4-30 - 4-45 p.m. Coffee break

- 4-45 p.m.Sc-7 L. Kozin (USSR)
Kinetics and Mechanism of
Electrode Processes of
Polyvalent Metals, Inter-
ferred by Chemical Reacti-
ons of Intermediates
- 5-15 p.m.Sc-8 S. Hagström (USA)
Materials Science - Oppor-
tunities and Challenges
- 5-45 p.m.Sc-9 V. Kudriavtsev (USSR)
Hydrogen Determination in
Metals
- 6-15 p.m.Sc-10 E. Lubnin (USSR)
Hydrogen Analysis in Meta-
llic Materials by Means of
Thermostimulated Desorpti-
on and Secondary Ions Mass
Spectroscopy
- 6-45 p.m.Sc-11 V. Grigoriev (USSR)
Application of Linear Ene-
rgy Relationship Principle
to the Study of Protective
Action of Inhibitors Mix-
ture