

THE OPTIMIZATION OF THE COMPOSITION, STRUCTURE AND PROPERTIES OF METALS, OXIDES, COMPOSITES, NANO - AND AMORPHOUS MATERIALS

PROCEEDINGS OF THE TWELFTH
"BI-NATIONAL WORKSHOP RUSSIA – ISRAEL"

Jerusalem
July 2013

**THE OPTIMIZATION OF THE COMPOSITION,
STRUCTURE AND PROPERTIES OF METALS, OXIDES,
COMPOSITES, NANO- AND AMORPHOUS MATERIALS**

**PROCEEDINGS OF THE TWELFTH "BI-NATIONAL
WORKSHOP RUSSIA -- ISRAEL"**

July 08 - 10

Jerusalem
2013

**The optimization of the composition, structure and properties of metals,
oxides, composites, nano and amorphous materials.**

Proceedings of the twelfth Israeli - Russian Bi-National Workshop 2013.

Ed. By M. Zinigrad and L. Leontiev.

Jerusalem, Israel 2013.

The book contains the results of investigations carried out in the field of physical chemistry of condensed matter.

The Conference is organized and supported by

Israel Academy of Sciences and Humanities

Russian Academy of Sciences

Russian fund of fundamental investigations

Ariel University

ISBN: 978-965-7376-31-7

Main editors:

Professor M. Zinigrad

Professor L. Leontiev

CONTENTS

	Preface	IX
1.	Fedorova O., Fetisov A., Fishman A., Kozhina G., Kurennikh T., Leontiev L., Mitrofanov V., Uporov S., Vedmid' L., Vykhodets V. Properties of mechanically activated oxides of the family "rare earth - manganese - oxygen"	1-26
2.	Mayorova A., Kulikova T., Leontiev L., Shunyaev K. Influence of Chlorine - Binding Additions on the Gas Phase Composition During Industrial Mixture Utilization.	27-31
3.	Lyakhov N., Vityaz P., Grigorieva T., Kovaleva S., Lobanovsky L., Senyut V., Gamzeleva T. Structure and Magnetic Properties of Sintered Alloys Based on Mechanically Activated Fe-Ga Powder.	32-41
4.	Lyakhov N., Vorsina I., Grigorieva T., Udalova T., Vosmerikov S., Ovchinnikov E., Struk V. Mechanocomposites on the Basis of Sevilen.	42-48
5.	Lyakhov N., Grigorieva T., Dyachkova L., Vorsina I., Udalova T., Vosmerikov S. Formation of Tungsten Mechanocomposites with Ta, Hf, Zr.	49-55
6.	Bormashenko E., Pogreb R., Balter S., Litvak N., Aurbach D. Soft Lithography Manufacturing of Moth-Eye Reliefs with Polymer Matrices Obtained by Breath Figures Self Assembly	56-64
7.	Bormashenko E., Pogreb R., Musin A., Bormashenko Y., Gendelman O., Balter R. Liquid Marbles Climbing Upward.	65- 73
8.	Yahalom A. Magnetic Helicity and the Aharonov-Bohm Constraint for Fusion	74-84
9.	Lebedeva I., Nechaev A., Valtsifer V., Strelnikov V. Synthesis and Structural Evolution of Mesoporous Alumina with Embedded Iron Oxide Nanoparticles	85-95
10.	Valtsifer V., Strelnikov V., Kondrashova N., Sizeneva I., Lebedeva I. Computer Simulation and Preparation of Silicate Compositions by Synthesis of Metal Oxide Nanoparticles in Silica Mesopores.	96-103
11.	Dotsenko Y., Selivorstov V., Borodianskiy K., Zinigrad M. Using a Promising Combined Technology to Improve the Mechanical Properties of Cast Articles Made from Alloys of the Al-Si System.	104-107
12.	Kuznetsov Yu., Koskenko A., Kazansky B. Investigation of Internal Stresses in Coatings Obtained by Plasma-Electrolytic Oxidation.	108-116

13.	Karabaev S., Gainullina I., Djunushalieva A., Akmatalieva A., Lugovskoy S., Pendin A. Adsorption of Ions of Heavy Metals from Water Solutions on Humic Acid and Humine of Brown Coal.	117-121
14.	Karabaev S., Kharchenko A., Lokshina I., Gainullina I., Alasheva D., Akmatalieva A., Lugovskoy S., Pendin A. Physico-Chemical Characteristic of Source and Mechanochemical Dispersed Samples of Humic Acid and Humine of Brown Coal.	122-130
15.	Zaikov Yu., Isakov A., Apisarov A., Chemezov O. Effect of Oxygen on the Structure of Silicon Electrodeposited from Halide Melts.	131-137
16.	Suzdaltsev A., Limanovskaya O., Nekrasov V., Kramov A., Zaikov Yu. Stationary Polarization of the Platinum Anodes in KF-NaF-AlF ₃ -Al ₂ O ₃ Melts.	138-146
17.	Dul'kin E., Patron A., Mojaev E., M. Roth. Relaxor Properties of the Barium Titanate Ferroelectric.	147-159
18.	Tsukerblat B., Palii A., Clemente-Juan Ju. M., Gaita-Ariño A., Coronado E. Nanosized Mixed Valence Metal Clusters: Advances and Challenges.	160-175
19.	Kossenko A., Lugovskoy S., Astashina N., Rogozhnikov A., Kazanski B., Zinigrad M. Effect of pH on the formation of hydroxyapatite in PEO process with hydrothermal treatment of the Ti alloy.	176-183
20.	Ayzenberg-Stepanenko M. and Mishuris G. Resonant Waves and Localization Phenomena in Lattice Structures	184-198
21.	M. Belinsky. Oscillation of the vector chirality of the V3, Cu3 nanomagnets under the field rotation.	199-243
22.	Antsiferov V., Astashina N., Kachenyuk M., Rogozhnikov G. Integral Methods of Developing Medical Implant-Tation Systems Based on Carbon Composite Mate-Rial and Titanium	244-250
23.	Kapilevich B., Litvak B. Microwave Characterization of Composite Building Materials.	251-258
24.	Grigorovich K. Development of Non Isothermal Hot Extraction Methods for Determihation of Forms of the Existense of Oxygen and Nitrogen in Metals and Nano-Sized Powders.	259-269
25.	Balai N., Pinhasi G., Pinhasi Y. Propagation of Ultra-Wide Band 'Chirped' Millimeter and Tera-Hertz Waves in the Atmospheric Medium.	270-289
26.	Kovrov V., Suzdaltsev A., Kramov A., Zaikov Yu. Electrode Processes at the Electrolysis of Molten Calcium Chloride	290-297

27.	Sipatov I., Kulikova T., Shunyaev K., Pastukhov E. Study of Thermochemical Properties of V-Ni and Ni-Ti Intermetallide Alloys.	298-303
28.	Dedyukhina E., Pechishcheva N., Bukharinova M., Shunyaev K. Water-Induced Fluorescence Quenching of N-(4-Methyl-2-Carboxy)- Phenyl-3- Minopropionic Acid.	304-308
29.	Shanchurov S., Ivanajskij A., Ivanajskij V., Ishkov A., Jamanbalin K. Specific Features of Modeling Induction Hardening of Agricultural Machinery Parts.	309-314
30.	Mayorova A., Evdokimova O., Pechishcheva N., Shunyaev K., Shchepetkin A., Zaytseva P., Pupyshev A. Selection of Internal Standard for ICP-AES Analysis of Ores, Concentrates and Slags by Thermodynamic Modeling.	315-327
31.	Evdokimova O., Zaitceva M., Pechishcheva N., Shunyaev K., Pupyshev A. Noritein S. Optimization of Sample Preparation by Fusion for XRF-Analysis of Tungsten Concentrates.	328-334
32.	Sholokhov M., Osokin I., Yerofeev V., Poloskov S. Computer Analysis of Arc Stability Under Narrow Gap Mig/Mag Welding.	335-343
33.	Fetisov A., Fishman A., Kurennykh T., Pastukhov E., Tkachev N., Vykhotets V., Shubin A. Interaction of Mechanoactivated Manganese Monoxide with Carbon Dioxide.	344-350
34.	Fishman A., Vykhotets V., Kurennykh T. Oxygen Tracer Diffusion in Manganese Oxides.	351-356
35.	Kulikova T., Mayorova A., Bykov V., Kishkoparov V., Shunyaev K. Investigation of Gas Phase Composition of Evaporated Cu-In Based Melts.	357-362
36.	Sirotin G., Ribakov Y., Nisnevich M. Effect of Fly Ash on Durability of Lightweight Concrete.	363-372
37.	Pushkar S., Verbitsky O. A Nested Anova as Remedy for Sacrificial Pseudoreplication in a Spatial Manipulative Experiment within an Enclosed Space.	373-381
38.	Pushkar S. Genetic Algorithm: optimization of building operational energy.	382-395
39.	Englman R. Optimization in Structure and Function of the Brain; A Model for Synaptic Plasticity	396-410
40.	Khalimullina Yu., Pershin P., Kholkina A., Arkhipov P., Zaikov Yu. Thin Layer Electrolysis in Chloride Melts.	411-414