

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

**PROCEEDINGS OF THE ELEVENTH
ISRAELI-RUSSIAN BI-NATIONAL
WORKSHOP 2012**

July 9-14

**Chernogolovka,
2012**

Russian Academy of Sciences
Israeli Academy of Sciences and Humanities
Russian Foundation for Basic Research
Institute of Problems of Chemical Physics of RAS
Institute of Metallurgy of UB RAS
Institute of Technical Chemistry of UB RAS
Institute of High Temperature Electrochemistry of UB RAS
Institute of Solid State Chemistry and Mechanochemistry of SB RAS
Ariel University Center of Samaria

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

**ELEVENTH
ISRAELI-RUSSIAN BI-NATIONAL
WORKSHOP 2012**

July 9-14

**Chernogolovka,
2012**

The Optimization of Composition, Structure and Properties of Metals, Oxides, Composites, Nano- and Amorphous Materials.
Proceedings of the 11th Israeli-Russian bi-national Workshop. -

Ed. by Prof. L. Leontiev and Prof. M. Zinigrad. Chernogolovka, 2012.

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

The Workshop is organized and supported by

The Russian Academy of Sciences
The Israeli Academy of Sciences and Humanities
Russian Foundation for Basic Research
Institute of Problems of Chemical Physics of RAS, Chernogolovka,
Russia
Institute of Metallurgy of UB RAS, Ekaterinburg, Russia
Institute of Solid State Chemistry and Mechanochemistry of SB RAS,
Novosibirsk, Russia
Institute of Technical Chemistry of UB RAS, Perm, Russia
Institute of High Temperature Electrochemistry of UB RAS,
Ekaterinburg, Russia
Ariel University Center of Samaria, Ariel, Israel

ISBN 978-5-9903818-1-0

© Ural Branch of Russian Academy of Sciences, 2012

CONTENTS

PREPARATION AND CHARACTERIZATION OF THE TANTALUM AND NIOBIUM NANOPOWDERS FOR NANOPOROUS MATERIALS PRODUCTION Blagoveshchenskiy Y.V., Isaeva N.V., Melnik Y.I., Blagoveshchenskaya N.V.	4-14
LOW-FREQUENCY OSCILLATION AFFECT TO TUNGSTEN AND VANADIUM CARBIDES INTERACTION WITH ALUMINIUM AND COPPER MELTS Bodrova L.E., Pastukhov E.A., Leontev L.I., Zinigrad M. I., Fishman A.J., Goyda E.Yu., Zaharov R.G, Petrova S.A., Fedorova O.M., Chentsov V.P.	15-20
PHASE EQUILIBRIUM IN BINARY SYSTEM Cu-Ga V.A. Bykov, T.V. Kulikova, S.A. Petrova, K.Yu. Shunyaev	21-26
FLUORESCENCE QUENCHING OF N-ARYL-3-AMINOPROPIONIC ACIDS BY COPPER IONS(II) E. Dedyukhina, N. Pechishcheva, K. Shunyaev, A. Belozerova	27-32
OPTIMIZATION OF SAMPLE PREPARATION FOR XRF DETERMINATION OF W, Ca, Si, Mn, P AND S IN TUNGSTEN CONCENTRATES O. Evdokimova, P. Zaytseva, N. Pechishcheva, K. Shunyaev, A. Pupyshev	33-42
OPTIMIZATION METHOD FOR PRODUCING MATERIALS BASED ON BISMUTH AND ANTIMONY TELLURIDES SOLID SOLUTIONS BY MELT SPINNING L.D. Ivanova, L.I. Petrova, Yu.V. Granatkina, V.G. Leontyev, A.S. Ivanov, S.A. Varlamov, Ju.P. Prilepo, A.M. Sychev, A.G. Chuiko, I.V. Bashkov	43-56
THE INFLUENCE OF FLUORIDE ADDITIVES ON THE PROPERTIES OF OXIDE LAYER PRODUCED BY PLASMA ELECTROLYTIC OXIDATION B. Kazanski, A. Kossenko, A. Lugovskoy, M. Zinigrad	57-67

ELECTROREFINING OF METALLIC LEAD-CONTAINING RAW MATERIALS Yu. Khalimullina, P. Arkhipov, Yu. Zaikov, V. Ashikhin, G. Skopov	68-75
INVESTIGATION OF THE GAS PHASE AT HIGH- TEMPERATURE THE DECOMPOSITION OF POLYPROPYLENE IN AIR ATMOSPHERE T.V. Kulikova, A.V. Mayorova, V.A. Bykov, K.Yu. Shunyaev	76-79
PROCESSING OF ZINC-CONTAINING METALLURGIC SLUDGES FOR THEIR FURTHER UTILIZATION D. Lempert, I. Gudkova, V. Dyubanov, G. Manelis	80-88
MAGNETIC PROPERTIES OF MECHANICALLY ACTIVATED OXIDE NdMnO _{3+δ} L.I. Leontiev, A.Ya. Fisman, V.Ya. Mitrofanov, S.A. Uporov	89-106
INVESTIGATION OF THE PROCESS AND PRODUCTS OF THE MASHS INTERACTION OF SILICON DIOXIDE WITH MAGNESIUM IN THE CARBON-FREE METHOD FOR OBTAINING SILICON Lyakhov N.Z., Vityaz P.A, Grigorieva T.F., Letsko A.I., Talako T.L., Vosmerikov S.V., Vorsina I.A., Udalova T.A.	107-115
REACTIONS OF RADICALS AT SURFACES SUSPENDED IN AQUEOUS SOLUTIONS D. Meyerstein	116-120
ACOUSTIC-EMISSION-ASSISTED STUDY OF CRITICAL PHENOMENA RESPONSIBLE FOR GIANT PIEZOELECTRICITY IN RELAXOR FERROELECTRIC CRYSTALS M. Roth, E. Dul'kin, E. Mojaev, M. Tseitlin	121-133

CALCULATION OF THERMODYNAMIC PROPERTIES OF AL-SC ALLOYS IN THE FRAMES OF STATISTICAL AND THERMODYNAMIC MODELS R.E. Ryltsev, T.V. Kulikova, K. Borodianskiy, A.V. Majorova, K.Y. Shunyaev, M.I. Zinigrad	134-142
SYNTHESIS, STRUCTURAL AND MAGNETIC PROPERTIES OF A NANOCOMPOSITE BASED ON MESOPOROUS SILICON OXIDE AND NICKEL OXIDE(II) E.V. Saenko, N.B. Kondrashova, V.A. Valtsifer, V.N. Strelnikov, V. Ya. Mitrofanov, S.A. Uporov, A.Ya. Fishman	143-152
SYNTHESIS, STRUCTURAL AND MAGNETIC PROPERTIES OF A NANOCOMPOSITE BASED ON MESOPOROUS SILICA AND IRON OXIDE Fe_2O_3 E.V. Saenko, N.B. Kondrashova, V.A. Valtsifer, V.N. Strelnikov, V. Ya. Mitrofanov, S.A. Uporov, A.Ya. Fishman	153-162
QUASI-PERIODIC MATERIALS DISCOVERY – THE ROLE OF TEM D. Shechtman	163-164
QUANTUM COMPUTING WITH MOLECULAR MAGNETS: SPIN-PHONON RELAXATION AND THE PROBLEM OF DECOHERENCE A. Tarantul, B. Tsukerblat	165-180
STRUCTURE AND TRIBOLOGICAL PROPERTIES OF Cu- Sn ALLOYS BASED ON MECHANICAL ACTIVATED POWDERS FORMED BY ELECTROCONTACT SINTERING P.A. Vityaz, S.A. Kovaliova, V.I. Zornik, V.A. Kukareko, T.F. Grigorieva, T.V. Gamzeleva, N.Z. Lyakhov	181-190
JOINT MECHANICAL ACTIVATION OF POLYAMIDE PA-6 AND KAOLINITE I.A. Vorsina, T.F. Grigorieva, T.A. Udalova, E.V. Ovchinnikov, V.A. Struk, N.Z. Lyakhov	191-198

- THE INFLUENCES OF LOW CONCENTRATION METAL ADDITIVES ON THE STRUCTURE AND PROPERTIES OF SINTERED TUNGSTEN BASED PSEUDOALLOYS 199-207
Grigoreva T. F., Dyachkova L.N., Kiseleva T. Yu., Vosmerikov S.V., Dechko M.M., Udalova T.A., Kovaleva S.V., Lyakhov N.Z.
- COMPOSITE PARTICLES INTERFACE AMORPHYSATION AT THE EARLY STAGES OF MECHANOSYNTHESIS IN $\text{Fe}_2\text{O}_3/\text{Fe}/(\text{Ga},\text{Al})$ POWDERS MIXTURES 208-217
Kiseleva T. Yu., Novakova A.A., Grigorieva T.F., Lyakhov N.Z.