

MICHAEL ZINIGRAD

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AREAS OF EXPERTISE

- Over 40 years of experience in Materials Science and Materials Engineering, Mathematical modeling and simulation.
- Founded the Research Laboratory for Advanced Materials Investigations.
- Theoretical and experimental investigations on high-temperature processes.
- Development of new materials based on mathematical modeling of physico-chemical and technological processes.
- Plasma electrolytic oxidation (PEO) coatings on aluminum and magnesium alloys created in aqueous solution and molten salt electrolytes.
- Solid oxide fuel cell investigation.
- Metal alloys strengthening by nanoparticles.
- Ink-jet printed thin layers.

Languages: Hebrew, English, German, Russian, Ukrainian

ACADEMIC AND PROFESSIONAL EXPERIENCE

1994 - *present* **Full professor**, *Ariel University, Ariel, Israel*
2008 - *present* **Rector**, *Ariel University, Ariel, Israel*
1995 - 2008 **Dean of the Natural Science Faculty**, *Ariel University Center, Ariel Israel*
1999 - *present* **Head of the Materials Research Center**, *Ariel University, Ariel, Israel*
1983 - 1992 **Professor**, *Urals Technical University, Ekaterinburg, Russia*
1988 - 1991 **Head of the Surfacing Department**, *Urals Polytechnic Institute, Sverdlovsk, USSR*

1976 - 1983 **Associated professor**, *Urals Polytechnic Institute, Sverdlovsk, USSR*
1972 - 1976 **Assistant**, *Urals Polytechnic Institute, Sverdlovsk, USSR*
1969 - 1972 **Post graduate**, *Urals Polytechnic Institute, Sverdlovsk, USSR*

Scientific supervision: 17 Ph.D. Students, 38 Masters Students and 5 Post-Docs

Publications and Patents: Over 200 scientific publications (incl. monograph, articles, and patents).

EDUCATION

1982 **D.Sc. Physical chemistry**
USSR Academy of Science, Institute of Metallurgy, Sverdlovsk
Thesis Title: *Kinetics and mechanism of the interaction of sulfide-metal and oxide melts*

1972 **Ph.D. Metallurgy of non-ferrous, noble and rare metals**
USSR Academy of Science, Institute of Electro-chemistry, Sverdlovsk
Thesis Title: *Kinetic analysis of sulfide sulfur oxidation by slags*

1968 **M.Sc. Metallurgical engineer, physico-chemical investigations of metallurgical processes**
Dnepropetrovsk Metallurgical Institute, Ukraine
Thesis Title: *Synthesis and crystallic structure of some solid solutions*

AWARDS AND MEMBERSHIP IN INTERNATIONAL ACADEMIC INSTITUTIONS

- 2009 **Member of the International Academy of Science and Higher Education, Russia**
2017 **Doctor Honoris Causa of Russian Academy of Science**
2017 **Honorary Professor of Ushynsky University, Odessa, Ukraine**

VISITING POSITIONS

- Sum. 1997 **Visiting Professor, Urals State Technical University, Sverdlovsk, Russia**
Sum. 1998 **Visiting Professor, Central Iron and Steel Institute, Beijing, China**
Sum. 2001 **Visiting Professor, Institute of Metallurgy, Russian National Academy of Science, Sverdlovsk, Russia**

PROFESSIONAL SOCIETIES & GOVERNMENT COMMITTEES

- Member of the National Committee on Technological Incubators under the Office of the Chief Scientist of Israel's Ministry of Industry, Trade and Labor (2007-2013), Israel
- American Welding Society (AWS), USA
- Materials Information Society (ASM International) , USA
- Coordination Committee for Metallurgical and Welding Technologies, Paton Institute, Kiev Ukraine

JOURNAL EDITORIAL BOARD MEMBERSHIPS

GUEST EDITOR

- *Israel Journal of Chemistry*, 2010, Vol. 47, No 3-4
- **Special issue, Welding, Joining and Casting of Advanced Materials, *Materials***, 2016-2017, Vol. 9-10
- **Special issue, Welding, Joining and Coating of Metallic Materials, *Materials***, 2018-2019
- **Special issue, Thin Coatings and Patterns by Inkjet Printing Technology, *Coatings***, 2018-2019

EDITORIAL BOARD MEMBER

- *Journal of Metals (High-Temperature Physical Chemistry and Electrochemistry of Melts)*
- *Journal of Ferrous Metals*
- *Journal of Non-Ferrous Metals*
- *The Paton Welding Journal*
- *Journal of Modern Electrometallurgy*

RESEARCH GRANTS

2019 -2021	Exact sciences-3D printing. Development of innovative 3D Ink-jet printing technology for efficient and durable solid oxide fuel cell.	Israeli Ministry of Science and Technology 595,000 NIS
2016-2019	Project: Solid oxide fuel cells (SOFC) – using scandium.	Norma Investments Ltd., British Virgin Islands; 800,000USD
2016-2019	Project: Photovoltaic cells doped with scandium.	Norma Investment Ltd., British Virgin Islands; 700,000USD
2016-2017	Zimin Foundation	500,000USD
2015-2017	Development of a technology for the Mechanical properties improvement of copper-based alloys by nano-sized materials.	Israeli Ministry of Economy and Industry, Framework Kamin; 794,000 NIS
2012 - 2015	Development of a technology for producing dental implants with surface coatings improved for osseo-integration.	Framework of the Resolution of the Perm Krai Government, Russia: Granting of subsidies for realization of scientific projects by international research groups of scientists on the base of state educational institutions of higher professional education; 93,246 USD
2009	Technology development for mechanical properties improvement of cast aluminum alloys by nano and ultrafine materials.	Israeli Ministry of Industry, Framework MAGNETON; 773,820 NIS
2007	Developing of the Metal Materials with required structure and properties using nano sized powders.	Israeli Ministry of Industry Framework NOFAR; 418,280NIS
2006	Environmentally Friendly Coating Technology As An Alternative To The Electrolytic Hard Chrome Plating.	Israeli Ministry of Industry Framework MAGNETON; 1,053,219 NIS
2006	Obtaining Compact Nanomaterials Based on Transition Metal Oxides by Intensive Plastic Deformations, Investigating their Structure and Properties.	Israeli Ministry of Science; 129,360 NIS
2004	Synthesis of compact nanocrystal lanthanum manganites by the hard plastic deformations method.	Israeli Ministry of Science; 40,000 NIS

	Investigations of the structure and stability of the nanostates in different oxidizing media, analysis of electric, magnetic and diffusion properties.	
2002	Air pressure Welding of Dissimilar Metals.	GM Foundation; 12,000 USD
1999 - 2001	Modeling and simulation in Materials Engineering.	GM Foundation; 35,000 USD
1998 - 2001	New compositions of flux core electrodes.	Israeli Ministry of Industry and Trade; 400,000 USD
1998 - 2000	Development of a new welding material.	GM Foundation; 45,000 USD
1997 - 2000	Development of high-temperature wear – resistant metallic material based on Ni-Al intermetallics.	China-Israel Foundation for Scientific and Strategic R&D; 100,000 USD Israeli Ministry of Science

LIST OF PUBLICATIONS

MONOGRAPH

1. V. Boronenkov, M. Zinigrad, L. Leontev, E. Pastukhov, M. Shalimov, S. Shanchurov, *Phase Interaction in the Metal—Oxides Melts—Gas System: The Modeling of Structure, Properties and Processes*. Springer, 407p. 2012.
[V. Boronenkov, M. Zinigrad, L. Leontev, E. Pastukhov, M. Shalimov, S. Shanchurov, *Simulation of structure properties and interphase interaction processes in the Metal – Oxides Melts – Gas System*. Ural Branch of the Russian Academy of Science Press, 450p. 2010].

BOOK CHAPTERS

1. K. Borodianskiy, M. Zinigrad, Computational Methods for Creation Materials with Required Composition and Structure. In *Materials Science* 445-464 (ed. I. Mastai) Intec publ., (2013).
2. A. Lugovskoy, M. Zinigrad, Plasma Electrolytic Oxidation of Valve Metals. In *Materials Science* 85-102 (ed. I. Mastai) Intec publ. (2013).

PATENTS

1. A. Balin, L. Barmin, M. Zinigrad, B. Zilbergleit, A. A. Kojevnikov, Yu. Plishevskiy, Flux for hardsurfacing. Patent USSR 1073975, 1983.
2. A. Balin, L. Barmin, M. Zinigrad, B. Zilbergleit, E. Shulimovich, I. Naydenov, Flux for hardsurfacing. Patent USSR 1075544, 1983.
3. V. Ilinsky, M. Zinigrad, A. Flyagin, A. Balin, M. Shalimov, L. Barmin, B. Zilbergleit, Ceramic flux for hardsurfacing Patent USSR 1352820, 1987.
4. V. Ilinsky, A. Okolzdaev, M. Zinigrad, A. Flyagin, A. Phephelov, N. Korolev, V. Merkulov, V. Miroshnichenko, Ceramic flux for hardsurfacing. Patent USSR 1485543, 1989.
5. A. Timoshin, P. Ivanov, M. Zinigrad, M. Shalimov, V. Tokar, Flux for electroslag remelting. Patent USSR 1767884, 1991.

6. A. Krasnopolski, M. Zinigrad, Method and system for cooling by using solar energy. Patent WO 2008135990 A2, 2008.
7. K. Borodianskiy, M. Zinigrad, A. Sobolev, A. Kossenko, A. Krasnopolski. Advanced methods of Plasma Electrolytic Oxidation (PEO) treatment using solid or foam-based electrolytes. US provisional patent application No. 62/629719 2018.
8. K. Borodianskiy, A. Krasnopolski, M. Zinigrad, Copper-based substances with nanomaterials. US provisional patent application No. 62/695055 2018.
9. V. Goldshtein, A. Kossenko, A. Sobolev, M. Zinigrad. Solid oxide fuel cell array generating ammonia as byproduct and utilizing ammonia as secondary fuel. US provisional patent application No. 62/787,387 2019.

ARTICLES

1. A. Schepetkin, V. Antonov, M. Zinigrad, A. Men, G. Chufarov, Crystal-chemical changes during titan cobalt dissociation at equilibrium conditions. *Zhurnal Fizicheskoy Khimii* **43**(12) 3084-3085 (1969).
2. A. Schepetkin, R. Zakharov, M. Zinigrad, G. Chufarov, Synthesis of spinel solid solutions in systems Me-Ti-Fe-O (Me = Zn, Co, Ni, Mn). *Crystallografiya* **14**(5) 889-894 (1969).
3. M. Zinigrad, L. Barmin, Velocity of the interaction of cupric sulfide with cupric oxide dissolved in slag. *Izvestiya vuzov. Tsvetnaya metallurgiya* **6** 28-33 (1971).
4. M. Zinigrad, L. Barmin, A. Sotnikov, S. Popel, M. Lvov, Kinetics of the interaction of cupric, nickel and cobalt sulfide with corresponding oxides dissolved in slag. *Izvestiya vuzov. Tsvetnaya metallurgiya* **1** 32-36 (1972).
5. M. Zinigrad, L. Barmin, The rate of cobalt sulfide oxidation by oxide melt involving cobalt oxide (II). *Fiziko-khimicheskie protsessy v tsvetnoy metallurgii* **204** 115-118 (1972).
6. M. Zinigrad, A. Sotnikov, L. Barmin, Investigation of the anodic polarization of liquid sulfides in oxide melts., *Izvestiya Ac. Nauk SSSR. Metalli* **3** 97-102 (1973).
7. A. Sotnikov, M. Zinigrad, L. Barmin, Oxygen role in kinetics of the interaction of Ni-S alloys with liquid oxides. *Izvestiya vuzov. Tsvetnaya metallurgiya* **6** 40-43 (1973).
8. M. Zinigrad, A. Sotnikov, L. Barmin, Investigation of sulfides-slugs interaction by relaxation techniques. *Fiziko-khimicheskiye issledovaniya metallurgicheskikh protsessov* **1** 80-86 (1973).
9. M. Zinigrad, L. Barmin, A. Sotnikov, Kinetics and the mechanism of sulfides oxidation by slag melts. In *Electrokhimiya i rasplavy* 228-235. Nauka, Moscow (1974).
10. Y. Nikitin, M. Zinigrad, A. Sotnikov, L. Barmin, The function of the absorption in processes of oxygen transition from slag to metal. In *Kinetics and thermodynamics of gases-liquid metals interaction* 72. Nauka, Moscow (1974).
11. M. Zinigrad, L. Malisheva, L. Barmin, Peculiarities of anodic polarization of liquid ferrous sulfide within liquid oxides. *Izvestiya vuzov. Tsvetnaya metallurgiya* **5** 91-95 (1975).
12. M. Zinigrad, L. Barmin, A. Sotnikov, Kinetics and mechanism of discharge of oxygen ions in liquid sulfides. *Fiziko-khimicheskiye issledovaniya metallurgicheskikh protsessov* **3** 79-82 (1975).
13. M. Zinigrad, L. Barmin, E. Eremin, B. Kulishenko, V. Kojurkov, Improvement of weld metal forming under welding of transformer steel. *Avtomaticheskaya svarka* **7** 66 (1976).

14. L. Barmin, M. Zinigrad, A. Flyagin, K. Zhdanovich, A. Zaitsev, Kinetics of aluminum transition through metal-slag boundary *Izvestiya vuzov. Chernaya metallurgiya* **7** 59-62 (1976).
15. M. Zinigrad, L. Malisheva, L. Barmin, Oxygen transition through ferrum sulfide/ionic melts interface. In *Physical chemistry of ionic melts* **2** 36. Institut Obsh'ey i neorganicheskoy khimii, AN UkSSR, Kiev (1976).
16. L. Malisheva, M. Zinigrad, L. Barmin, Investigation of oxygen transition through the boundary of ferrous sulfide and oxide melt. *Izvestiya vuzov. Tsvetnaya metallurgiya* **1** 148-150 (1977).
17. A. Flyagin, L. Barmin, V. Kojurkov, M. Zinigrad, K. Zhdanovich, A. Zaytsev, Equilibrium distribution of aluminum between iron alloys and slag. *Fiziko-khimicheskiye issledovaniya metallurgicheskikh protsessov* **5** 76-79 (1977).
18. M. Zinigrad, A. Flyagin, Electrochemical behavior of aluminum at iron-carbon melt/oxide electrolyte interface. In *Present problems of physical chemistry of solutions* **2** 47-51. VINITI, Leningrad (1978).
19. L. Panphilova, M. Zinigrad, L. Barmin, The influence of oxygen surface concentration in Me-S alloys on kinetics of oxygen transition through the boundary of sulfide and oxide melt. *Zhurnal Fizicheskoy Khimii* **52**(10) 2491-2494 (1978).
20. L. Barmin, M. Zinigrad, A. Panov, K. Zhdanovich, A. Zaytsev, Influence of temperature and concentration of aluminum on melts viscosity in system Fe-C-Al. *Fiziko-khimicheskiye issledovaniya metallurgicheskikh protsessov* **6** 54-58 (1978).
21. E. Eremin, B. Kulishenko, M. Zinigrad, On tungsten electrode stability while welding in mixture of argon and carbon oxide. *Svarochnoye proizvodstvo* **1** 17-18 (1979).
22. V. Boronenkov, S. Shantshurov, M. Zinigrad, Kinetics of the interaction of multicomponent metal with slag under diffusion conditions. *Izvestiya Ac. Nauk SSSR. Metalli* **6** 21-27 (1979).
23. Y. Nikitin, E. Belyaeva, M. Zinigrad, Kinetics of slag spreading over metal in the conditions of component transition across the interface. *Fiziko-khimicheskiye issledovaniya metallurgicheskikh protsessov* **7** 116-122 (1979).
24. L. Panphilova, M. Zinigrad, L. Barmin, Laws of the oxidation of ferrous, cupric, nickel and cobalt sulfides by slags. *Izvestiya Ac. Nauk SSSR. Metalli* **4** 19-24 (1979).
25. A. Flyagin, M. Zinigrad, L. Barmin, Kinetics of ionic exchange between Fe-C-Al melt and an oxide electrolyte. *Elektrokhimiya* **15**(12) 1858-1861 (1979).
26. L. Barmin, Yu. Aganaev, B. Kulishenko, M. Zinigrad, B. Pastuchov, V. Chlinov, The influence of the surface properties of the liquid phase on the formation of crystallization cracks during the surfacing of iron-boron alloys. *Adgeziya rasplavov i payka materialov* **5** 83-85 (1980).
27. M. Zinigrad, V. Kojurkov, A. Flyagin, The effect of aluminum and carbon on the equilibrium concentration of oxygen in the iron - carbon melt. *Fiziko-khimicheskiye issledovaniya metallurgicheskikh protsessov* **8** 82-103 (1980).
28. M. Zinigrad, A. Sotnikov, A. Flyagin, L. Barmin, On the regime of electrochemical oxidation of aluminum at the metal - slag interface. *Fiziko-khimicheskiye issledovaniya metallurgicheskikh protsessov* **8** 99-104 (1980).
29. M. Zinigrad, S. Panov, L. Barmin, Sulfur transfer through metal melt - slag melt interface. *Chermetinformatsiya* **931** (1980).

30. M. Zinigrad, S. Panov, L. Barmin, Limiting stage of Fe-C melt desulphurization by slags. *Chermetinformatsiya* **938** (1980).
31. M. Zinigrad, G. Toporistshev, V. Najdenov, Limiting stage of sulfur oxidation from sulfide melts by oxygen from slags. *Izvestiya vuzov. Tsvetnaya metallurgiya* **1** 29-33 (1981).
32. M. Zinigrad, S. Panov, L. Barmin, K. Zhdanovich, Kinetic features of the desulfurization of iron-carbon melt by slag. *Izvestiya vuzov. Tchernaya metallurgiya* **2** 4-6 (1981).
33. M. Zinigrad, G. Toporistshev, Rate of fast stage of sulfur oxidation from sulfide melts by slag oxygen. *Izvestiya vuzov. Tsvetnaya metallurgiya* **2** 32-36 (1981).
34. L. Panphilova, M. Zinigrad, L. Barmin, Quick stage kinetics of oxygen ion discharge on the boundary of sulfide melts and liquid oxides. *Electrokhimiya* **17**(9) 1346-1349 (1981).
35. M. Zinigrad, The peculiarities of oxidation of sulfur from sulfide-metal melts by liquid slags' oxygen. *Fiziko-khimicheskiye issledovaniya metallurgicheskikh protsessov* **9** 87-104 (1981).
36. M. Zinigrad, S. Panov, L. Barmin, M. Shalimov, Investigation of the distribution of sulfur between Fe-C-S melt and CaO-Al₂O₃-MgO slag. *Fiziko-khimicheskiye issledovaniya metallurgicheskikh protsessov* **9** 60-64 (1981).
37. M. Zinigrad, S. Panov, L. Barmin, Kinetic parameters of sulfur transition quick stage through the boundary of Fe-C and oxide melts. *Electrokhimiya* **18**(4) 523-526 (1982).
38. M. Zinigrad, L. Barmin, L. Panphilova, Kinetic analysis of the reactions of interaction of oxides and sulfides of copper, iron, nickel and cobalt. *Fiziko-khimicheskiye issledovaniya metallurgicheskikh protsessov* **10** 83-87 (1982).
39. M. Shalimov, M. Zinigrad, S. Panov, L. Barmin, K. Zhdanovich, A. Zaytsev, Kinetic analysis of joint transfer of S, Fe, C, Al metal - synthetic slag interface. *Fiziko-khimicheskiye issledovaniya metallurgicheskikh protsessov* **10** 107-114 (1982).
40. M. Zinigrad, A. Phephelov, L. Barmin, M. Shalimov, The oxidation rate of boron that is dissolved in metal by oxide melt. *Chermetinformatsiya* **1533** (1982).
41. M. Zinigrad, A. Phephelov, L. Barmin, M. Shalimov, The peculiarities of kinetic stage of boron transfer through metal - oxide interface. *Chermetinformatsiya* **1569** (1982).
42. M. Zinigrad, L. Panphilova, L. Barmin, Surface concentration of oxygen in sulfide-metal melts and the rate of oxygen transition through sulfide - oxide melt interface. In *Surface properties of melts* 286. Naukova dumka, Kiev (1982).
43. M. Zinigrad, N. Korolev, I. Noskov, L. Tolstych, Physico-chemical peculiarities of alloying of weld metal. In *Welding materials* 37. Naukova dumka, Kiev (1982).
44. V. Boronenkov, M. Zinigrad, M. Shalimov, L. Barmin, K. Zhdanovich, Mathematical modeling of metal and slag processes interaction in a ladle. *Izvestiya vuzov. Tchernaya metallurgiya*, **1** 36-41 (1983).
45. Y. Nikitin, S. Tretyakov, M. Zinigrad, N. Vlasov, Kinetics of formation of the sulfide-metal melt/oxide melt. *Fiziko-khimicheskiye issledovaniya metallurgicheskikh protsessov* **11** 128-132 (1983).
46. M. Shalimov, A. Phephelov, M. Zinigrad, L. Barmin, Calculation of the metal composition after hardsurfacing under ceramic flux. *Avtomaticheskaya svarka* **1** 33-37 (1984).
47. M. Shalimov, M. Zinigrad, S. Panov, A. Phephelov, A. Flyagin, Calculation of equilibrium distribution of elements between metal and slag melts. In *Structure and properties of slag melts*, 62-66. Kurgan machinostroitelnyy institut (1984).

48. M. Zinigrad, A. Timoshin, V. Lepinsky, Cathodic deposition of Fe, Ni, Co from the melt based on MgF. In *Structure and properties of slag melts* **2** 73. Kurgan machinostroitelnyy institut (1984).
49. A. Phephelov, M. Zinigrad, B. Arnautov, Flux for alloying of metal by boron in hardsurfacing. *Svarochnoye proizvodstvo* **4** 21-22 (1985).
50. A. Phephelov, M. Zinigrad, B. Arnautov, Influence of boron flux concentration on the coefficient of boron transition into hardsurfacing metal. *Svarochnoye proizvodstvo* **10** 36-37 (1985).
51. M. Zinigrad, A. Balin, A. Phephelov, L. Barmin, M. Shalimov, Kinetics of boron reduction from oxide melt by carbon that is dissolved in Fe. *Chermetinformatsiya* **3017** (1985).
52. M. Zinigrad, A. Okolzdaev, A. Flyagin, Anodic oxidation of tungsten on metal/oxide electrolyte interface. In *Physical chemistry of high temperature and electrochemistry* **1** 167. Uralskiy Nauchnyy Tsentr, AN SSSR, Sverdlovsk (1985).
53. M. Shalimov, A. Flyagin, M. Zinigrad, Improving the technology of the ladle treatment of steel using mathematical modeling. In *Theory and Practice of the Ladle Treatment of Steel* 128-130. Moscow (1985).
54. A. Flyagin, A. Phephelov, M. Zinigrad, M. Shalimov, Kinetics of Al and B crossing through the boundary liquid metal-oxide melt. *Izvestiya Ac. Nauk SSSR. Metally* **1** 50-55 (1986).
55. M. Zinigrad, A. Phephelov, L. Barmin, M. Shalimov, Kinetics of interaction of a boron-containing metal melt with an oxide electrolyte. *Electrokhimiya* **22**(1) 74-78 (1986).
56. A. Balin, M. Zinigrad, L. Barmin, B. Silberglait, Alloying of weld metal by reduction of elements from flux oxides. *Teoriya i praktika svarki* 24-27 (1986).
57. M. Shalimov, A. Flyagin, M. Zinigrad, M. Ilinsky, Dephosphorization of metal during submerged arc welding. *Teoriya i praktika svarki* 19-23 (1986).
58. Zinigrad, A. Okolzdaev, A. Flyagin, V. Merkulov, Influence of phase composition and temperature on the equilibrium distribution of tungsten between metal and slag melts. *Rasplavy* **1**(5) 7-11 (1987).
59. A. Timoshin, M. Zinigrad, Development and application of low fluoride neutral flux for electrosag remelting alloys. *Problemy spetsialnoy electrometallurgiyi* **4** 21-25, (1987).
60. M. Zinigrad, A. Phephelov, M. Shalimov, A. Balin, Modeling of building-up processes. *Teoriya i praktika svarki* **5** 20 (1987).
61. N. Razikov, M. Zinigrad, V. Shumjakov, Interaction of oxides of alkali metals with iron in flux-cored wire arc welding. *Avtomaticheskaya svarka* **3** 34-36 (1988).
62. M. Zinigrad, A. Balin, L. Barmin, B. Zilbergleit, Hardsurfacing of 170 8CP steel with chromium and boron recovery from slag. *Avtomaticheskaya svarka* **5** 52-55 (1988).
63. M. Zinigrad, A. Okolzdaev, A. Flyagin, Limiting stage of tungsten anodic oxidation on boundary of metal and oxide melts. *Rasplavy* **2** (3) 46-51 (1988).
64. M. Zinigrad, A. Okolzdaev, A. Flyagin, K. Zhdanovich, Quick stage of tungsten oxidation on boundary of metal and oxide melts. *Rasplavy* **2**(4) 19-25 (1988).
65. A. Flyagin, A. Okolzdaev, M. Zinigrad, Application of oxide tungsten compounds for alloying of metal in submerged arc built welding. *Svarochnoye proizvodstvo* **10** 41-43 (1988).
66. M. Jadkevich, S. Zimin, B. Statnikov, M. Zinigrad, Influence of technological parameters of electron beam spraying on content of heat resistant coating. *Fiziko-khimicheskaya mekhanika materialov* **4** 56-61 (1989).

67. M. Jadkevich, S. Zimin, D. Ishchenko, M. Zinigrad, I. Koritko, B. Statnikov, Study of the dependence of the efficiency of electron beam heating on the angle of incidence of the beam on the surface of the body. *Fizika i khimiya obrabotki materialov* **6** 46-48 (1989).
68. M. Zinigrad, A. Flyagin, Modeling of metal alloying in submerged arc built welding. *Informatsionnie materiali* **1**(35) 53-57 (1989).
69. M. Zinigrad, A. Flyagin, A. Okolzdaev, M. Shalimov, Improvement of technology of remelting of waste involving tungsten by application of modeling. *Izvestiya vuzov. Chernaya metallurgiya* **12** 59-62 (1991).
70. A. Flyagin, A. Okolzdaev, M. Zinigrad, K. Zhdanovich, Kinetics of tungsten reduction from molten oxide by carbon of metallic phase. *Rasplavy* **4** 37-41 (1993).
71. M. Zinigrad, A. Zinigrad, *The mathematical model of welding process optimization*. *Chimia, Israel* **45** 93-98 (1999).
72. M. Zinigrad, V. Mazurovsky, Development of new welding materials on the base of mathematical modeling of metallurgical processes. Part 1: Phase Interaction Analysis and Development of the Basic Model. In *The optimization of composition, structure and properties of metals, oxides, composites, nano and amorphous materials* 277-291. Bi-National Russia-Israel Workshop, Ekaterinburg (2002).
73. M. Zinigrad, V. Mazurovsky, Development of new welding materials on the base of mathematical modeling of metallurgical processes. Part 2: Development of Solution Algorithm and Software. In *The optimization of composition, structure and properties of metals, oxides, composites, nano and amorphous materials* 292-303. Bi-National Russia-Israel Workshop, Ekaterinburg (2002).
74. V. Mazurovsky, M. Zinigrad, A. Zinigrad, L. Leontev, V. Lisin, New approach to welding materials design. In *The optimization of composition, structure and properties of metals, oxides, composites, nano and amorphous materials* 144-154. Bi-National Israel-Russia Workshop, Jerusalem (2003).
75. V. Mazurovsky, M. Zinigrad, A. Zinigrad, L. Leontev, V. Lisin, The phenomenological model of non-equilibrium crystallization and strengthening-phase-formation processes in the weld. In *The optimization of composition, structure and properties of metals, oxides, composites, nano and amorphous materials* 155-167. Bi-National Israel-Russia Workshop, Jerusalem (2003).
76. V. Mazurovsky, M. Zinigrad, L. Leontev, Computer simulation of transformation in the metal melt of weld pool. *Rasplavy* **3** 85-94 (2003).
77. V. Mazurovskij, M. Zinigrad, L. Leontev, V. Lisin, The main principles of development of modern surfacing materials. *Tekhnologiya metallov* **7** 34-39 (2004).
78. V. Mazurovsky, M. Zinigrad, L. Leontev, V. Lisin, Physicochemical analysis and modeling of the primary crystallization processes of a metal during welding. In *The optimization of composition, structure and properties of metals, oxides, composites, nano and amorphous materials*. 68-63. Bi-National Russia-Israel Workshop, St. Petersburg (2004).
79. V. Mazurovsky, M. Zinigrad, L. Leontev, V. Lisin, Physicochemical analysis and phenomenological model of the secondary crystallization processes of a metal during welding. In *The optimization of composition, structure and properties of metals, oxides, composites, nano and amorphous materials* 84-96. Bi-National Russia-Israel Workshop, St. Petersburg (2004).

80. V. Mazurovsky, M. Zinigrad, L. Leontev, V. Lisin, Mathematical representation of a modified constitution Schaeffler diagram. *Izvestiya Ac. Nauk SSSR. Metall* **3** 114-119 (2004).
81. V. Mazurovsky, M. Zinigrad, L. Leontev, V. Lisin, Physicochemical analysis and simulation of primary crystallization of a metal in the course of welding. *Glass Physics and Chemistry* **31**(1) 67-73 Nauka/Interperiodica (2005).
82. V. Mazurovsky, M. Zinigrad, L. Leontev, V. Lisin, Physicochemical analysis and the phenomenological model of secondary crystallization of a metal in the course of welding. *Glass Physics and Chemistry* **31**(1) 74-79 Nauka/Interperiodica (2005).
83. V. Mazurovsky, M. Zinigrad, L. Leontev, V. Lisin, Computer-aided design of advanced welding consumables. *The Paton Welding Journal* **3** 2-6 (2005).
84. B. Gizhevskii, V. Zhuravlev, R. Zakharov, M. Zinigrad, E. Kozlov, L. Leontev, S. Naumov, S. Petrova, V. Pilugin, A. Fishman, N. Chebotaev, Obtaining of 3D nanostructure manganites $\text{LaMnO}_{3+\delta}$ by quasistatic and dynamic deformations. *Doklady Akademii Nauk* **405**(4) 489-492 (2005).
85. M. Zinigrad, V. Mazurovsky, K. Borodianskiy, Physico-chemical and mathematical modeling of phase interaction taking place during fusion welding processes. *Materialwissenschaft und Werkstofftechnik* **36**(10) 489-496 (2005).
86. N. Chebotaev, A. Gedanken, B. Gizhevskii, A. Fetisov, A. Fishman, E. Kozlov, T. Kurennykh, L. Leontev, S. Naumov, A. Patselov, S. Petrova, V. Pilugin, V. Vykhodets, R. Zakharov, M. Zinigrad, Effect of severe deformation on microstructure and stoichiometry of some oxides of transition metals. In *The optimization of composition, structure and properties of metals, oxides, composites, nano and amorphous materials* 56-75. Bi-National Israel-Russia Workshop, Jerusalem (2005).
87. V. Mazurovsky, M. Zinigrad, L. Leontev, Experimental testing of a new approach to the development of welding materials. In *The optimization of composition, structure and properties of metals, oxides, composites, nano and amorphous materials* 177-191. Bi-National Israel-Russia Workshop, Jerusalem (2005).
88. V. Mazurovsky, M. Zinigrad, L. Leontev. Principles of modeling for computer-aided design of welding materials. In *The optimization of composition, structure and properties of metals, oxides, composites, nano and amorphous materials* 192-206. Bi-National Israel-Russia Workshop, Jerusalem (2005).
89. T. Arbuzova, N. Chebotaev, B. Gizhevskii, A. Fetisov, A. Fishman, E. Kozlov, T. Kyrennykh, L. Leontev, V. Lisin, S. Naumov, S. Petrova, V. Pilugin, Yu. Sukhorukov, V. Vykhodets, R. Zakharov, M. Zinigrad, Structure and properties of compact nanocrystal oxides obtained by severe plastic deformation. In *The optimization of composition, structure and properties of metals, oxides, composites, nano and amorphous materials* 5-24. Bi-National Russia-Israel Workshop, Novosibirsk (2006).
90. M. Zinigrad, Kinetic model of high temperature physicochemical processes. In *The optimization of composition, structure and properties of metals, oxides, composites, nano and amorphous materials* 152-172. Bi-National Russia-Israel Workshop, Novosibirsk (2006).
91. M. Zinigrad, Computational method for development of new welding materials. *Computational Material Science* **37**(4) 417-424 (2006).
92. A. Fishman, M. Ivanov, N. Tkachev, K. Shunyaev, M. Zinigrad, Phase transitions in mixed Jahn–Teller systems with competitive interactions. *Defect and Diffusion Forum* **258-260** 130-136 (2006).

93. M. Radune, D. Ophir, A. Lugovskoy, M. Zinigrad, D. Eliezer, A sulfur diffusion investigation in metal and oxide phases. *Defect and Diffusion Forum* **258-260** 433-440 (2006).
94. N. Zalomov, V. Boronenkov, M. Zinigrad, S. Shanchurov, Interaction between water vapor and welding fluxes according to the polymer theory. *Glass Physics and Chemistry* **33(5)** 455-458 (2007).
95. N. Zalomov, V. Boronenkov, M. Zinigrad, S. Shanchurov, On calculating the activity of components in binary silicate melts. *Glass Physics and Chemistry* **33(5)** 459-463 (2007).
96. A. Kossenko, A. Lugovskoy, M. Zinigrad, A mathematical model of powder components oxidation during thermal spray process. *Israel Journal of Chemistry* **47(3-4)** 273-277 (2007).
97. K. Borodianskiy, V. Mazurovsky, M. Zinigrad, A. Gedanken, Creation of shock-abrasion resistance build-up metal using a physicochemical model of high-temperature processes. *Israel Journal of Chemistry* **47(3-4)** 351-355 (2007).
98. A. Lugovskoy, M. Zinigrad, D. Aurbach, Electrochemical determination of diffusion coefficients of iron (II) ions in chloride melts at 700-750°C. *Israel Journal of Chemistry* **47(3-4)** 409-414 (2007).
99. A. Lugovskoy, M. Zinigrad, D. Aurbach and A. Fishman, Study of electrochemical deposition of iron (II) ions on a solid tungsten electrode in chloride melts at 700-750°C. In *The optimization of composition, structure and properties of metals, oxides, composites, nano and amorphous materials* 77-84. Bi-National Israel-Russia Workshop, Jerusalem (2007).
100. T. Arbuzova, B. Gizhevskii, A. Fetisov, T. Filinkova, A. Fishman, E. Kozlov, I. Krynetsky, T. Kyrennykh, L. Leontev, S. Naumov, S. Petrova, V. Vykhodets, R. Zakharov, M. Zinigrad, Effect of severe deformations on microstructure and properties of some oxides of transition metal. In *The optimization of composition, structure and properties of metals, oxides, composites, nano and amorphous materials* 256-273. Bi-National Israel-Russia Workshop, Jerusalem (2007).
101. M. Zinigrad, Analysis of a scientific direction with historical and technological preconditions. In *Collection of Scientific Publications* 73-80. USTU, Ekaterinburg (2007).
102. V. Mazurovsky, M. Zinigrad and L. Leontev, Design of modern welding materials on the base of computer modelling. In *Collection of Scientific Publications* 102-115. USTU, Ekaterinburg (2007).
103. S. Lugovskoy, M. Nisnevitch, M. Zinigrad and D. Wolf, Mechanochemical synthesis of salicylic acid–formaldehyde chelating co-polymer, *Clean Technologies and Environmental Policy* **10(3)** 279-285 (2008).
104. M. Radune, A. Radune, F. Assous, M. Zinigrad, D. Eliezer, Investigation of sulfur transition through metal-slag phase boundary in natural moving conditions. *Defect and Diffusion Forum* **273-276** 752-756 (2008).
105. A. Kossenko, Y. Kuznetsov, M. Zinigrad, Combined technology of repairing and hardening of machine parts. In *The optimization of composition, structure and properties of metals, oxides, composites, nano and amorphous materials* 78-90. Bi-National Russia-Israel Workshop, Perm (2008).
106. K. Borodianskiy, V. Mazurovsky, A. Gedanken, M. Zinigrad, Developing a required structure of metals using computational methods, *Material Science and Engineering: A* **497(1-2)** 322-325 (2008).
107. S. Lugovskoy, A. Lugovskoy, M. Zinigrad, Mechanochemical activation of dispersed layer composites on the basis of talc and a series of biological active species. In *The optimization*

- of composition, structure and properties of metals, oxides, composites, nano and amorphous materials* 74-76. Bi-National Israel-Russia Workshop, Jerusalem (2009).
108. V. Selivorstov, Y. Dotsenko, K. Borodianskiy, A. Kossenko, M. Zinigrad, Al-Si alloys structure formation using gas-dynamic modification. *The optimization of composition, structure and properties of metals, oxides, composites, nano and amorphous materials* 143-149. Bi-National Israel-Russia Workshop, Jerusalem (2009).
 109. S. Lugovskoy, M. Nisnevitch, A. Lugovskoy, M. Zinigrad, Mechanochemical synthesis of dispersed layer composites on the basis of talc and a series of biological active species. *Clean Techn. and Environmental Policy* **11**(3) 277–282 (2009).
 110. A. Lugovskoy, M. Zinigrad, D. Aurbach, Z. Unger, Electrodeposition of iron (II) on platinum in chloride melts at 700–750°C, *Electrochimica Acta* **54**(6) 1904-1908 (2009).
 111. M. Radune, A. Radune, F. Assous, M. Zinigrad, Modelling and computer simulation of reagents diffusion in high temperature diffusion controlled heterogeneous reactions. *Archives of Comput. Mater. Sc. & Surf. Eng.* **1**(4) 225-231 (2009).
 112. M. Radune, A. Radune, F. Assous, M. Zinigrad, Investigation of a mathematical model of high-temperature diffusion controlled heterogeneous reaction between metal and oxide melts. *Defect and Diffusion Forum* **297** 1475-1480 (2010).
 113. A. Lugovskoy, Z. Unger, M. Zinigrad, D. Aurbach, Anomalous diffusion coefficients for W(IV) ion diffusion in NaCl-KCl melt at 700-750°C. *Defect and Diffusion Forum* **297-301** 1481-1486 (2010).
 114. A. Lugovskoy, Z. Unger, M. Zinigrad, D. Aurbach, Zinc ion reduction on solid metal electrodes in chloride melts. In *The optimization of composition, structure and properties of metals, oxides, composites, nano and amorphous materials* 104-447. Bi-National Russia-Israel Workshop, Belokhurikha (2010).
 115. E. Bormashenko, A. Musin, R. Pogreb, E. Luz, M. Zinigrad, Thickness of gravity-flattened water layers (“puddles”) deposited on the polymer substrates and the hysteresis of the contact angle. *Colloids and Surfaces A: Physicochemical and Engineering Aspects* **372**(1-3) 135–138 (2010).
 116. I. Rusonik, H. Cohen, A. Lugovskoy, A. Krasnopolski, M. Zinigrad, D. Meyerstein, The effect of an electrical bias on the mechanism of decomposition of transients with metal-carbon σ bonds, *Eur. J. Inorg. Chem.* **2010**(21) 3252-3255 (2010).
 117. Y. Dotsenko, V. Selivorstov, K. Borodianskiy, A. Kossenko, M. Zinigrad, Structure formation control using gas-dynamic effect and modification to improve properties of Al-Si casting alloys. In *The optimization of composition, structure and properties of metals, oxides, composites, nano and amorphous materials* 163-167. Bi-National Israel-Russia Workshop, Jerusalem (2011).
 118. E. Bormashenko, A. Musin, M. Zinigrad, Evaporation of droplets on strongly and weakly pinning surface and dynamics of the triple line. *Colloids and Surfaces A: Physicochemical and Engineering Aspects* **385**(1-3) 235-240 (2011).
 119. M. Radune, M. Zinigrad, D. Mogilyanski, D. Fuks, N. Frage, Preparation of (Ti, Al)N solid solution by mechanical alloying. In *The optimization of composition, structure and properties of metals, oxides, composites, nano and amorphous materials* 279-286. Bi-National Israel-Russia Workshop, Jerusalem (2011).
 120. K. Borodianskiy, M. Zinigrad, A. Gedanken, Aluminum A356 reinforcement by carbide nanoparticles, *J. Nano Research* **13** 41-46 (2011).

121. B. Kazanski, A. Kossenko, A. Lugovskoy, M. Zinigrad, Fluoride influence on the properties of oxide layer produced by plasma electrolytic oxidation. *Defect and Diffusion Forum*, **326-328** 498-503 (2012).
122. L. Bodrova, E. Pastukhov, L. Leontev, M. Zinigrad, A. Fishman, E. Goyda, R. Zaharov, S. Petrova, O. Fedorova, V. Chentsov, Low-frequency oscillation affect to tungsten and vanadium carbides interaction with aluminium and copper melts. In *The optimization of composition, structure and properties of metals, oxides, composites, nano and amorphous materials* 15-20. Bi-National Russia-Israel Workshop, Chernogolovka (2012).
123. B. Kazanski, A. Kossenko, A. Lugovskoy, M. Zinigrad, The influence of fluoride additives on the properties of oxide layer produced by plasma electrolytic oxidation. In *The optimization of composition, structure and properties of metals, oxides, composites, nano and amorphous materials* 57-67. Bi-National Russia-Israel Workshop, Chernogolovka (2012).
124. S. Lugovskoy, M. Zinigrad, M. Eliazade, Modifying the sorption capacity of biopolymers by the mechanochemical activation, *Defect and Diffusion Forum* **326-328** 504-508 (2012).
125. E. Bormashenko, A. Musin, G. Whyman, M. Zinigrad, Wetting transitions and depinning of the triple line. *Langmuir* **28**(7) 3460-3464 (2012).
126. R. Ryltsev, T. Kulikova, K. Borodianskiy, A. Majorova, K. Shunyaev, M. Zinigrad, Calculation of Thermodynamic Properties of Al-Sc alloys in the frames of statistical and thermodynamic models. In *The optimization of composition, structure and properties of metals, oxides, composites, nano and amorphous materials* 134-142. Bi-National Russia-Israel Workshop, Chernogolovka (2012).
127. Y. Dotsenko, V. Selivorstov, K. Borodianskiy, M. Zinigrad, Using a promising combined technology to improve the mechanical properties of cast articles made from alloys of the Al-Si system. In *The optimization of composition, structure and properties of metals, oxides, composites, nano and amorphous materials* 104-107. Bi-National Israel-Russia Workshop, Jerusalem (2013).
128. Kossenko, S. Lugovskoy, N. Astashina, A. Rogozhnikov, B. Kazanski, M. Zinigrad. Effect of pH on the formation of hydroxyapatite in PEO process with hydrothermal treatment of the Ti alloy. In *The optimization of composition, structure and properties of metals, oxides, composites, nano and amorphous materials* 176-183. Bi-National Israel-Russia Workshop, Jerusalem (2013).
129. K. Borodianskiy, A. Kossenko, M. Zinigrad, Improvement of mechanical properties of aluminum A356 alloy by TiC nanoparticles, *Metall. Mat. Trans. A* **44A**(11) 4948-4953 (2013).
130. B. Kazanski, A. Kossenko, M. Zinigrad, A. Lugovskoy, Fluoride ions as modifiers of the oxide layer produced by plasma electrolytic oxidation on AZ91D magnesium alloy. *Applied Surface Science* **287**(15) 461-466 (2013).
131. A. Kossenko, S. Lugovskoy, N. Astashina, A. Lugovskoy, M. Zinigrad, Effect of time on the formation of hydroxyapatite in PEO process with hydrothermal treatment of the Ti-6Al-4V alloy. *Glass Physics and Chemistry* **39**(6) 639-642 (2013).
132. A. Lugovskoy, M. Zinigrad, A. Kossenko, B. Kazanski, Production of ceramic layers on aluminum alloys by plasma electrolytic oxidation in alkaline silicate electrolytes. *Applied Surface Science* **264**(1) 743-747 (2013).
133. E. Bormashenko, A. Musin, G. Whyman, Z. Barkay, M. Zinigrad, Revisiting the fine structure of the triple line. *Langmuir* **29** (46) 14163-14167 (2013).

134. M. Radune, A. Radune, S. Lugovskoy, M. Zinigrad, D. Fuks, N. Frage, Mathematical modeling of high energy ball milling (HEBM) process. *Defect and Diffusion Forum* **353** 126-130 (2014).
135. A. Kossenko, A. Lugovskoy, M. Zinigrad, The surface modification of creep-resistant magnesium alloys by PEO. In *The optimization of composition, structure and properties of metals, oxides, composites, nano and amorphous materials* 94-103. Bi-National Israel-Russia Workshop, Ekaterinburg (2014).
136. S. Yado, M. Zinigrad, Synthesis and thermal analysis of nanocomposites based on intermetallic compounds in the Ni-Al system and Al₂O₃. *Glass physics and chemistry* **41** (2) 194-205 (2015).
137. K. Borodianskiy, M. Zinigrad, Novel methods of metals mechanical properties improvement. In *The optimization of composition, structure and properties of metals, oxides, composites, nano and amorphous materials* 14-22. Bi-National Israel-Russia Workshop, Ariel (2015).
138. M. Radune, M. Zinigrad and N. Frage, Formation of supersaturated (Ti,Al)N solid solution by high energy ball milling of TiN-AlN powders. In *The optimization of composition, structure and properties of metals, oxides, composites, nano and amorphous materials* 176-184. Bi-National Israel-Russia Workshop, Ariel (2015).
139. Y. Kuznetsov, A. Kossenko, M. Zinigrad, L. Kalashnikova, Analysis of dependence of plasma electrolytic oxidation parameters influence on coating wearresistance. In *The optimization of composition, structure and properties of metals, oxides, composites, nano and amorphous materials* 269-274. Bi-National Israel-Russia Workshop, Ariel (2015).
140. B. Kazanski, A. Lugovskoy, O. Gaon, M. Zinigrad, Comparison of electrochemical and chemical corrosion behavior of MRI 230D magnesium alloy with and without Plasma Electrolytic Oxidation treatment. *Defect and Diffusion Forum* **364** 27-34 (2015).
141. A. Kossenko, M. Zinigrad, A universal electrolyte for the plasma electrolytic oxidation of aluminum and magnesium alloys. *Materials & Design* **88** 302-309 (2015).
142. K. Borodianskiy, V. Selivorstov, Y. Dotsenko, M. Zinigrad, Effect of additions of ceramic nanoparticles and gas-dynamic treatment on Al casting alloys, *Metals* **5(4)** 2277-2288 (2015).
143. K. Borodianskiy, M. Zinigrad, Mechanical properties and microstructure characterization of Al-Si cast alloys formation using carbide nanoparticles. *Journal of Materials Sciences and Applications* **1** (3) 85-90 (2015).
144. E Bormashenko, A Musin, G Whyman, Z Barkay, M Zinigrad, *On universality of scaling law describing roughness of triple line*, *The European Physical Journal E* **38** (1) 2 (2015).
145. M. Radune, M. Zinigrad, N. Frage, Optimization of high energy ball milling parameters for synthesis of Ti_{1-x}Al_xN powder. *Journal of Nano Research*, **38** 107-113 (2016).
146. K. Borodianskiy, M. Zinigrad, Modification performance of WC nanoparticles in aluminum and an Al-Si casting alloy, *Metall. Mat. Trans. B* **47(2)** 1302-1308 (2016).
147. M. Radune, M. Zinigrad S. Kalabukhov, M. Sokol, V.I. Chumanov, N. Frage, Spark plasma sintering of Ti_{1-x}Al_xN nano-powders synthesized by high-energy ball milling. *Ceramics International* **42(9)** 11077-11084 (2016).
148. A. Kossenko, M. Zinigrad, KOH vs. NaOH in electrolytes of the plasma electrolytic oxidation. In *The optimization of composition, structure and properties of metals, oxides, composites, nano and amorphous materials* 51-57. Bi-National Russia-Israel Workshop, Ariel (2016).

149. M. Radune, M. Zinigrad, D. Fuks, S. Hayun, N. Frage, Thermal decomposition of supersaturated $Ti_{1-x}Al_xN$ solid solution synthesized by high-energy milling. *Diffusion Foundations* **9** 82-89 (2016).
150. K. Borodianskiy, M. Zinigrad, Nanomaterials applications in modern metallurgical processes. *Diffusion Foundations* **9** 30-41 (2016).
151. E. Borojovich, R. Bar-Ziv, O. Oster-Golberg, H. Sebbag, M. Zinigrad, D. Meyerstein, T. Zidki, Halo-organic pollutants: The effect of an electrical bias on their decomposition mechanism on porous iron electrodes. *Applied Catalysis B: Environmental* **210**(5) 255-262 (2017).
152. N. Kamanina, A. Kukharchik, S. Likhomanova, S. Serov, P. Vasilyev, A. Krasnopolski, A. Musin, M. Zinigrad, Advantages of the materials surfaces nanostructuring. In *The optimization of composition, structure and properties of metals, oxides, composites, nano and amorphous materials* 9-15. Bi-National Israel-Russia Workshop, Ariel (2017).
153. B. Kazanski Traubin, A. Lugovskoy, M. Zinigrad, Corrosion protection of MRI230D magnesium alloy by the plasma electrolytic oxidation. In *The optimization of composition, structure and properties of metals, oxides, composites, nano and amorphous materials* 196-202. Bi-National Israel-Russia Workshop, Ariel (2017).
154. G. Whyman, M. Zinigrad, A. Kalashnikov, Optimal dopant concentration in scandium doped cubic zirconium oxide used in solid oxide fuel cells. In *The optimization of composition, structure and properties of metals, oxides, composites, nano and amorphous materials* 301-304. Bi-National Israel-Russia Workshop, Ariel (2017).
155. A. Sobolev, A. Kossenko, M. Zinigrad, K. Borodianskiy, An investigation of oxide coating synthesized on an aluminum alloy by plasma electrolytic oxidation in molten salt. *Applied Sciences* **7**(9) 889-898 (2017).
156. N. Astashina, A. Lugovskoy, A. Kossenko, S. Lugovskoy, G. Rogozhnikov, M. Zinigrad, Investigation of the effectiveness of dental implant osseointegration characterized by different surface types. *Metals* **7**(6) 203 (2017).
157. K. Borodianskiy, M. Zinigrad, L. Leontev, Investigation of alloys modification by nanomaterials. *Izvestiya. Ferrous Metallurgy* **60**(11) 897-903 (2017).
158. G. Whyman, A. Kalashnikov, M. Zinigrad, On the dependence of the ionic conductivity on dopant concentration in the cubic zirconium oxide doped with oxides of trivalent metals. *Solid State Ionics* **316** 34-37 (2018).
159. A. Sobolev, A. Kossenko, M. Zinigrad, K. Borodianskiy, Coating of aluminum alloys by micro arc oxidation in nitrate salt. In *The optimization of composition, structure and properties of metals, oxides, composites, nano and amorphous materials* 190-198. Bi-National Israel-Russia Workshop, Moscow (2018).
160. M. Zinigrad, Calculation of the equilibrium composition of metallic and oxide melts during their interaction. In *The optimization of composition, structure and properties of metals, oxides, composites, nano and amorphous materials* 262-272. Bi-National Israel-Russia Workshop, Moscow (2018).
161. M. Zinigrad, Simulation of metal-oxide melt interaction in view of kinetics of chemical reactions in the interphase boundary. In *The optimization of composition, structure and properties of metals, oxides, composites, nano and amorphous materials* 273-286. Bi-National Israel-Russia Workshop, Moscow (2018).

162. A. Sobolev, A. Kossenko, M. Zinigrad, K. Borodianskiy, Comparison of plasma electrolytic oxidation coatings on Al alloy created in aqueous solution and molten salt electrolytes. *Surface & Coatings Technology* **344** 590-595 (2018).
163. A. Kossenko, M. Zinigrad, Special features of oxide layer formation on magnesium alloys during plasma electrolytic oxidation. *Glass Physics and Chemistry* **44**(2) 62-70 (2018).
164. A. Sobolev, I. Wolicki, A. Kossenko, M. Zinigrad, K. Borodianskiy, Coating formation on Ti-6Al-4V alloy by micro arc oxidation in molten salt. *Materials* **11**(9) 1611 (2018).
165. A. Sobolev, A. Musin, G. Whyman, K. Borodianskiy, O. Krichevski, A. Kalashnikov, M. Zinigrad, Stabilization of cubic phase in scandium-doped zirconia nanocrystals synthesized with sol-gel method. *J. Am. Ceram. Soc.* **2018** 1-8 (forthcoming, 2019).
166. G. Whyman, A Kalashnikov, M. Zinigrad, Entropy of mixing as a stabilization factor of the cubic phase of Scandium doped zirconia. *Solis State ionics* **333** 16-17 (2019).

CONFERENCE PROCEEDINGS

1. M. Zinigrad, L. Barmin, S. Popel, M. Lvov, Application of the corrosion diagram method for investigation of reaction kinetic on boundary of metal and slag melts. In *Proceedings of the International Symposium: New methods of investigation of metal reduction processes* 149-162. Moscow (1972).
2. M. Zinigrad, A. Flyagin, Kinetics of redox reactions of metal and flux involving aluminum. In *Proceedings of the Ural Welding Conference* 15. Sverdlovsk (1976).
3. M. Zinigrad, S. Panov, L. Barmin, Viscosity coefficient depends on concentration. In *Proceedings of the All-Russian conference: Structure and properties of metallic and slag melts* 70. Uralskiy Nauchniy Tsentr, AN SSSR, Sverdlovsk (1976).
4. V. Boronenkov, S. Shanchurov, M. Zinigrad, Kinetic analysis of the processes occurring in the combined oxidation of metal impurities. In *Proceedings of the Third All-Union Scientific Conference on Current Problems in the Electrometallurgy of Steel* **206** 83-89 (1978).
5. S. Panov, M. Zinigrad, L. Barmin, Investigation of the fast step of the desulphurization of iron-carbon melt by slag. In *Proceedings of the All-Russian conference: Structure and properties of metallic and slag melts* 60-63. Uralskiy Nauchniy Tsentr, AN SSSR, Sverdlovsk (1980).
6. M. Zinigrad, A. Phephelov, L. Barmin, Interaction of Fe-B melts and slag melts. In *Proceedings of the All-Russian conference: Structure and properties of metallic and slag melts* 89. Uralskiy Nauchniy Tsentr, AN SSSR, Sverdlovsk (1980).
7. M. Zinigrad, S. Panov, Desulphurization of Fe-C melts by oxides. In *Proceedings of the All-Russian conference: Structure and properties of metallic and slag melts* 142. Uralskiy Nauchniy Tsentr, AN SSSR, Sverdlovsk (1983).
8. M. Zinigrad, A. Timoshin, Computer equipment for investigation of kinetics of electrochemical processes. In *Proceedings of the All-Russian conference: Structure and properties of metallic and slag melts* 310-311. Uralskiy Nauchniy Tsentr, AN SSSR, Sverdlovsk (1986).
9. M. Zinigrad, Physico-chemical and mathematical modeling of metal and oxide melts interaction. In *Proceedings of the All-Russian conference: Structure and properties of metallic and slag melts* 25-27. Uralskiy Nauchniy Tsentr, AN SSSR, Sverdlovsk (1986).

10. M. Zinigrad, Modeling of metal and slag melt interaction. In *Proceedings of the Bases of physico-chemical and technological data* 182. Institut Chernoy Metallurgii, Dnepropetrovsk (1988).
11. M. Zinigrad, Development and production of ceramic flux. In *Proceedings of the Advances and prospects of welding production* 132. Moscow (1988).
12. A. Flyagin, M. Zinigrad, Calculation of metal composition after hardsurfacing under flux. In *Proceedings of the Welding Conference* 130-137. Perm (1989).
13. S. Panov, M. Shalimov, M. Zinigrad, Velocity of metal desulfurization in hardsurfacing and submerged arc welding. *Proceedings of the Welding Conference* 138-142. Perm (1989).
14. M. Zinigrad, A. Flyagin, A. Okolzdaev, Thermodynamics and kinetics of tungsten transition through the boundary of Fe-C and slag melts. In *Proceedings of the First International Symposium on Theory of Metallurgical Processes* 111-115. Moscow (1989).
15. M. Zinigrad, A. Flyagin, E. Melnikova, Model and program of metal composition calculation in hardsurfacing. In *Proceedings of the Scientific Seminar* 46-49. Leningrad (1990).
16. M. Zinigrad, A. Okolzdaev, A. Flyagin, Influence of slag properties on tungsten transition velocity through the boundary of Fe-C and slag melts. In *Proceedings of the Seventh Conference on Physical Chemistry of Melts* 208-211. Cheljabinsk (1990).
17. M. Zinigrad, A. Flyagin, A. Okolzdaev, M. Shalimov, Improvement of technology of the processing of waste involving tungsten in the arc steel-making furnace. In *Proceedings of the Bases of physico-chemical and technological data* 190. Kurgan machinostroitelnyy institut (1990).
18. M. Zinigrad, Modeling of composition and properties of materials. In *Proceedings of the Bases of physico-chemical and technological data* 112. Kurgan machinostroitelnyy institut (1990).
19. M. Zinigrad, A. Okolzdaev. Limiting stage of tungsten anodic oxidation on the boundary of molten metal and slag. In *Fourth International Conference on Molten Slags and Fluxes* 62, Sendai, Japan, 1992.
20. M. Zinigrad. Simulation of metal and slag melts interaction for optimization and development of technological processes. In *Fourth International Conference on Molten Slags and Fluxes* 125, Sendai, Japan, 1992.
21. M. Zinigrad, V. Mazurovsky, O. Gafri, Development of the new welding materials made of waste products. In *Proceedings of the Welding Conference* 63-67. Israel (1994).
22. M. Zinigrad, V. Mazurovsky, Modeling of metallurgical welding processes for the purpose of creating new welding materials. In *Proceedings of the Modeling and Simulation in Metallurgical Engineering and Materials Science International Conference (MSMM'96)* 669-673. Beijing (1996).
23. M. Zinigrad, N. Zalomov, V. Mazurovsky, O. Aksyutin, Creating new welding materials on the basis of metallurgical processes modeling. In *Seventh International Conference on Computer Technology in Welding, San Francisco, CA* 291-297. NIST Special Publication 923 (1997).
24. M. Zinigrad, M. Shalimov, Application of simulation methods of the analysis of the kinetics of electrochemical processes in melts. In *Proceedings of the Fourth International Colloquium on Process Simulation* 591-597. Espoo (1997).

25. V. Boronenkov, M. Shalimov, M. Zinigrad, The mathematical model of chemical processes during the oxyflame melting of copper concentrates. In *Proceedings of the International Symposium*. Saint Petersburg (1997).
26. M. Zinigrad, N. Zalomov, V. Mazurovsky, O. Aksyutin, Computer approach to the development of welding materials. In *Eighth International Conference on Computer Technology in Welding, Liverpool* 185-192. Elsevier Science & Technology (1998).
27. N. Zalomov, M. Zinigrad, V. Boronenkov, Thermodynamics of silicate and aluminate oxide melts used in welding and metallurgical processes. In *Proceedings of Materials Solutions Conference '99 on Joining of Advanced and Specialty Materials II* 236-242, Cincinnati, OH, ASM International (1999).
28. M. Zinigrad, V. Mazurovsky, F. Di, Y. Wujun, N. Zalomov, Modeling of the build up process for production of Ni-Al based high temperature wear resistant coatings. In *Proceedings of International Symposium on Steel for Fabricated Structures* 230-233. Cincinnati, OH (1999).
29. M. Zinigrad, V. Mazurovsky, Computer modeling of metallurgical technologies. In *Ninth International Conference on Computer Technology in Welding, Michigan, MA* 164-171. NIST Special Publication 949 (2000).
30. M. Zinigrad, V. Mazurovsky, V. Shumyakov, A. Zinigrad, Optimization of the composition of a flux-cored wire for welding galvanized steel based on computer simulation of the welding process. In *Tenth International Conference on Computer Technology in Welding, Copenhagen* 40-47. TWI (2000).
31. M. Zinigrad, Development of new welding materials and technologies based on computer simulation. In *Proceedings of the First International Conference Mathematical Modeling and Simulation of Metal Technologies* 140-151. Ariel (2000).
32. V. Mazurovsky, M. Zinigrad, A. Zinigrad, Novel method of welding materials design. In *Proceedings of the First International Conference Mathematical Modeling and Simulation of Metal Technologies* 201-206. Ariel (2000).
33. V. Mazurovsky, A. Zinigrad, M. Zinigrad, Predicting weld structure using modified Schaeffler constitution diagram. In *Proceedings of the First International Conference Mathematical Modeling and Simulation of Metal Technologies* 540-545. Ariel (2000).
34. V. Mazurovsky, M. Zinigrad, A. Zinigrad, Novel computer-aided method of welding materials design. In *Eleventh International Conference on Computer Technology in Welding Columbus, OH* 273-280. NIST Special Publication 973 (2002).
35. V. Shumiakov, M. Shalimov, M. Zinigrad, Coated electrodes with advanced ecological properties. In *Proceedings of the Ural Welding Conference*. Russia (2002).
36. M. Zinigrad, V. Mazurovsky, A. Zinigrad, The development of electrode coating compositions basing on the mathematical modeling of physicochemical processes on metal-slag boundary. In *Proceedings of the Mills Symposium on Metals, Slags, and Glasses: High Temperatures, Properties and Phenomena* 545-553. London (2002).
37. K. Shunyaev, V. Lisin, M. Zinigrad, Arbitrary stoichiometry associates and mixture thermodynamics in liquid alloys. In *Proceedings of the Second International Conference on Mathematical Modeling and Computer Simulation of Metal Technologies* **1** 12-18. Ariel (2002).
38. M. Shalimov, M. Zinigrad, V. Lisin, Thermodynamic characteristics of reactions in metal-slag-gas systems. In *Proceedings of the Second International Conference on Mathematical Modeling and Computer Simulation of Metal Technologies* **1** 130-146. Ariel (2002).

39. V. Mazurovsky, M. Zinigrad, A. Zinigrad, Development of a computer-aided method for designing welding materials. In *Proceedings of the Second International Conference on Mathematical Modeling and Computer Simulation of Metal Technologies* **2** 29-37. Ariel (2002).
40. V. Mazurovsky, M. Zinigrad, A. Zinigrad, Mathematical representation of a modified Schaeffler diagram. In *Proceedings of the Second International Conference on Mathematical Modeling and Computer Simulation of Metal Technologies* **3** 129-139. Ariel (2002).
41. V. Mazurovsky, M. Zinigrad, A. Zinigrad, Mathematical model of weld microstructure formation. In *Twelfth International Conference on Computer Technology in Welding, Sidney* 79. TWI (2003).
42. M. Zinigrad, V. Mazurovsky, A. Zinigrad, Mathematical modeling of phase interaction taking place during fusion welding processes. In *International symposium, Metallurgical and materials processing: principles and technologies* 667-680. San Diego, CA. (2003).
43. B. Zilbergleyt, M. Zinigrad, Thermodynamic simulation of complex metallurgical and chemical systems with the method of chemical dynamics. In *Proceedings of the International symposium on Process Control and Optimization in Ferrous and non-Ferrous Metallurgy* 63-76. Chicago, MI (2003).
44. V. Mazurovsky, M. Zinigrad, L. Leontev, V. Lisin, New approach to the design of advanced welding materials. In *Proceedings of the Third International Conference on Mathematical Modeling and Computer Simulation of Material Technologies* **2** 1-12. Ariel (2004).
45. V. Mazurovsky, M. Zinigrad, V. Mazurovsky, N. Litvak, V. Shumyakov, Implementation of an approach for creating advanced welding materials. In *Proceedings of the Third International Conference on Mathematical Modeling and Computer Simulation of Material Technologies* **2** 12-24. Ariel (2004).
46. K. Shunyaev, N. Pechischeva, M. Zinigrad, Peritectic diagrams of associated solutions. In *Proceedings of the Third International Conference on Mathematical Modeling and Computer Simulation of Material Technologies* **3** 113-118. Ariel (2004).
47. V. Mazurovsky, M. Zinigrad, L. Leontev, V. Lisin, Carbide formation during crystallization upon welding. In *Proceedings of the Third International Conference on Mathematical Modeling and Computer Simulation of Material Technologies* **3** 126-134. Ariel (2004).
48. M. Zinigrad, V. Mazurovsky, K. Borodianskiy, A. Gedanken, Computer simulation of the primary crystallization processes of a metal during welding. In *Proceedings of the Second International Conference on Welding and Joining 2005: Frontiers of Materials Joining*. Tel-Aviv (2005).
49. V. Mazurovsky, M. Zinigrad, L. Leontev, V. Lisin, K. Borodianskiy, Quantitative estimation of carbide-forming abilities of *d*-elements. In *Proceedings of the Jubilee Scientific Conference on Physical Chemistry and Technology in Metallurgy* 89-98. Ekaterinburg (2005).
50. M. Zinigrad, V. Mazurovsky, K. Borodianskiy, Physico-chemical and mathematical modeling of phase interaction taking place during fusion welding processes. In *Proceedings of the First International Conference on Diffusion in Solid and Liquids* 841-850. Aveiro (2005).
51. V. Mazurovsky, M. Zinigrad, K. Borodianskiy, Welding materials design. In *Proceedings of the First International Electronic Scientific and Technical Conference Computer Technologies in Joining of Materials* 225-231. Tula (2005).

52. S. Petrova, V. Pilugin, A. Fishman, N. Chebotaev, The influence of plastic deformations on the structure of lanthanum manganite. In *Proceedings of the Fifth National Conference on the Applications of X-ray, Synchrotrone Irradiation, Neutrons and Electrons for the Study of Nano-Materials and Nano-Systems. RSNE Nano-2005* 97. Moscow (2005).
53. K. Borodianskiy, M. Zinigrad, V. Mazurovsky, Computer simulation of the carbide formation during primary crystallization processes of a metal. In *Proceedings of the Third International Conference on Welding and Joining 2006: Frontiers of Materials Joining*. Tel-Aviv (2006).
54. A. Kossenko, A. Lugovskoy, M. Zinigrad, A mathematical model of powder components oxidation during thermal spray process. In *Proceedings of the Fourth International Conference on Mathematical Modeling and Computer Simulation of Material Technologies* **3** 65-69. Ariel (2006).
55. T. Arbuzova, A. Ermakov, B. Gizhevskii, V. Fetisov, T. Filenkova, A. Fishman, G. Kozhina, L. Leontev, E. Mirosnikova, S. Naumov, S. Petrova, R. Zakharov, M. Zinigrad, Structural, electrochemical and magnetic properties of compact nanocrystal LaMnO_{3-d} oxides produced mechanochemically. In *Proceedings of the Fourth International Conference on Mathematical Modeling and Computer Simulation of Material Technologies* **3** 109-120. Ariel (2006).
56. K. Borodianskiy, V. Mazurovsky, M. Zinigrad, A. Gedanken, Creation of shock-abrasion resistance build-up metal using physico-chemical model of high temperature processes. In *Proceedings of the Fourth International Conference on Mathematical Modeling and Computer Simulation of Material Technologies* **3** 83-92. Ariel (2006).
57. A. Fishman, M. Ivanov, N. Tkachev, K. Shunyaev, M. Zinigrad, Competitive interactions and phase states of mixed Jahn–Teller systems. In *Proceedings of the Fourth International Conference on Mathematical Modeling and Computer Simulation of Material Technologies* **1** 132-150. Ariel (2006).
58. S. Lugovskoy, M. Nisnevitch, A. Lugovskoy, M. Zinigrad, D. Wolf, Mechanochemical synthesis of salicylic acidformaldehyde co-polymer capable of binding heavy metal ions. In *Proceedings of the Fourth International Conference on Mathematical Modeling and Computer Simulation of Material Technologies* **4** 158-166. Ariel (2006).
59. K. Borodianskiy, A. Lugovskoy, V. Mazurovsky, M. Zinigrad, A. Gedanken, Modeling of the weld metal microstructure. In *Proceedings of the International Conference on Computer Technology in Welding and Manufacturing* 147-150. Kiev (2006).
60. T. Arbuzova, N. Chebotaev, B. Gizhevskii, A. Fetisov, E. Kozlov, T. Kyrennykh, L. Leontev, S. Naumov, A. Patselov, V. Pilugin, Yu. Sukhorukov, V. Vykhodets, R. Zakharov, M. Zinigrad, Synthesis of compact nanocrystal oxides by severe plastic deformations methods. In *Proceedings of the Sohn International Symposium: Advanced processing of metals and materials* 157-169. San Diego, CA. (2006).
61. M. Zinigrad, K. Shunyaev, A. Lugovskoy, The calculation of thermodynamic properties and phase diagrams of binary alloys on the basis of chrome. In *Proceedings of the Sohn International Symposium: Advanced processing of metals and materials* 659-665. San Diego, CA. (2006).
62. M. Radune, F. Assous, M. Zinigrad, D. Eliezer, The Development of a mathematical model of sulfur diffusion in the steel and slag phases in its transition from the steel into the slag. In *Proceedings of the Fifth International Conference on Mathematical Modeling and Computer Simulation of Material Technologies* **1** 145-154. Ariel (2008).

63. K. Borodianskiy, A. Basov, A. Gedanken, M. Zinigrad, Mechanical alloying of Cu-Al₂O₃ nanoparticles. In *Proceedings of the Fifth International Conference on Mathematical Modeling and Computer Simulation of Material Technologies* **2** 141-144. Ariel (2008).
64. A. Fetisov, T. Filinkova, A. Fishman, T. Grigorieva, L. Leontev, V. Lisin, N. Lyakhov, S. Petrova, R. Zakharov, M. Zinigrad, The structure of mechanoactivated manganese oxides. In *Proceedings of the Fifth International Conference on Mathematical Modeling and Computer Simulation of Material Technologies* **2** 159-169. Ariel (2008).
65. M. Remennik, A. Kossenko, A. Lugovskoy, M. Zinigrad, A. Gedanken, Corrosion resistance of aluminum alloys treated by micro arc oxidation in different electrolytes. In *Proceedings of the Fifth International Conference on Mathematical Modeling and Computer Simulation of Material Technologies* **4** 59-62. Ariel (2008).
66. Y. Kuznetsov, A. Kossenko, M. Zinigrad, Modern two stage coating technology. In *Proceedings of the Fifth International Conference on Mathematical Modeling and Computer Simulation of Material Technologies* **4** 82-89. Ariel (2008).
67. V. Selivorstov, Y. Dotsenko, K. Borodianskiy, M. Zinigrad, Control of non-equilibrium crystallization of aluminum. In *Proceedings of the Sixth International Conference on Mathematical Modeling and Computer Simulation of Material Technologies* **1** 155-162. Ariel (2010).
68. Y. Dotsenko, V. Selivorstov, K. Borodianskiy, M. Zinigrad, Peculiarities of using hereditary properties of metallic stock with high iron content to obtain high quality Al-Si casting alloy. In *Proceedings of the Seventh International Conference on Mathematical Modeling and Computer Simulation of Material Technologies* **1** 256-260. Ariel (2012).
69. A. Lugovskoy, B. Kazanski, M. Zinigrad, Macrokinetics of plasma electrolytic oxidation of AZ91D alloy. In *Proceedings of the 16th IFAC Symposium on Automation in Mining, Mineral and Metal Processing* **46**(16) 421-424. San Diego, CA. (2013).
70. Yu. Kuznetsov, A. Kossenko, M. Zinigrad. Investigation of coating thickness obtained by plasma electrolytic oxidation on aluminium alloys in electrolytes of type "KOH-H₃BO₃". In *Proceedings of the Eighth International Conference on Mathematical Modeling and Computer Simulation of Material Technologies* **1** 80-85. Ariel (2014).
71. M. Radune, M. Zinigrad, N. Frumin, S. Hayun, N. Frage, Thermal stability of supersaturated (Ti, Al)N solid solution. In *Proceedings of the Eighth International Conference on Mathematical Modeling and Computer Simulation of Material Technologies* **1** 102-111. Ariel (2014).
72. M. Radune, M. Zinigrad, S. Kalabukhov, D. Fuks, S. Hayun, N. Frage, Spark plasma sintering of Ti_{1-x}Al_xN nano-powders synthesized by high energy ball milling. In *Proceedings of the Ninth International Conference on Mathematical Modeling and Computer Simulation of Material Technologies* **1** 168-180. Ariel (2016).
73. A. Sobolev, A. Kossenko, M. Zinigrad, K. Borodianskiy, Creation of oxide coating on Al 1050 alloy. In *Proceedings of the Tenth International Conference on Mathematical Modeling and Computer Simulation of Material Technologies* **1** 158-164. Ariel (2018).
74. B. Kazanski, A. Lugovskoy, M. Zinigrad, Effect of plasma electrolytic oxidation treatment on corrosion behavior of AZ91D, AM50, AE42 and MRI 230D magnesium alloys. In *Proceedings of the Tenth International Conference on Mathematical Modeling and Computer Simulation of Material Technologies* **2** 20-35. Ariel (2018).

75. N. Astashina, A. Lugovskoy, A. Kossenko, S. Lugovskoy, M. Zinigrad, F. Nakonechny, Analysis of efficiency of dental implant osseointegration characterized by various surface types. In *Proceedings of the Tenth International Conference on Mathematical Modeling and Computer Simulation of Material Technologies* **5** 18-23. Ariel (2018).