

Churakova Anna

16/07/1990

Russia, city Ufa

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PhD



Profile

The research work is related to the study of the microstructure and physical-mechanical, functional properties of alloys of the TiNi system with a shape memory effect under conditions of thermal and mechanocyclic effects. Study of the corrosion behavior of TiNi alloys in various structural states.

H-INDEXT 11 (Web of Science Researcher ID: G-7552-2013)

H-INDEXT 11 (Scopus ID: 55513933000)

Education

In 2012 she graduated from Ufa State Aviation Technical University, specialty "Nanomaterials".

From 2012 to 2016 years studied at the postgraduate course of the Institute of Physics of Molecules and Crystals of the Ufa Science Center of the Russian Academy of Sciences, specializing in Condensed State Physics.

Candidate of physical and mathematical sciences (PhD).

Knowledge, skills

Specialist in research of metals and alloys

- studies of physical and mechanical properties (hardness, microhardness, sediment tests, tribological tests, DSC (calorimetric tests), mechanical tensile tests and three-point bending, fatigue tests, nanoindentation), data processing using a PC, analysis of the results obtained
- structural studies (optical metallography, scanning electron microscopy with EBSD analysis of grain misorientations / subgrains and the use of energy-dispersive analysis to evaluate the chemical composition of alloys, transmission electron microscopy - working with foils
- structural studies (X-ray diffraction and X-ray phase analysis, x-ray diffraction imaging and analysis of results)
- Analyze literature, writing articles, presentation work

Experience

16.07.2012-14.12.2012 Ufa State Aviation Technical University, Department of Nanotechnologies - Engineer

01.11.2013-29.11.2013 Ufa State Aviation Technical University, Institute of Advanced Materials Physics - Engineer

11/30/2013 - 12/12/2017 Institute of Physics of Molecules and Crystals of the Ufa Science Center of the Russian Academy of Sciences - Junior Researcher

05/13/2017 - current. Institute of Molecule and Crystal Physics - Subdivision of the Ufa Federal Research Centre of the Russian Academy of Sciences (IMCP UFRC RAS) - Research

01/20/2014-20/12/2016 Ufa State Aviation Technical University, Institute of Advanced Materials Physics (part-time) - Engineer

12/21/2016 – 12/14/2020. Ufa State Aviation Technical University, Institute of Advanced Materials Physics (part-time) - Junior Researcher

09/01/2017-06/30/2022 Ufa State Aviation Technical University, Department of Materials Science and Physics of Metals (part-time) - Associate Professor

09/01/2022 - present temp. Ufa University of Science and Technology, Department of Materials Science and Physics of Metals (part-time) - Associate Professor

Training courses, internships

1. Teaching competence of a teacher of higher education - 12.10.2017-25.10.2017 - "Ufa State Aviation Technical University"

2. Technology of work in the electronic information educational environment - 21.11.2017-05.12.2017 - "Ufa State Aviation Technical University"

3. Scientific internship at Nanjing University of Science and Technology (27.11.2017-28.12.12.2017)

Publications

1. Prabhu Y., Srivastav A.K., Churakova A., Gunderov D.V., Bhatt Ja. CRYSTALLIZATION KINETICS ON MELT SPUN AND HPT-PROCESSED ZR62CU22AL10FE5DY1 METALLIC GLASS // Metallurgical and Materials Transactions A: Physical Metallurgy and Materials Science. 2023. T. 54. № 1. C. 39-52.

2. Churakova A., Vorobiev E., Kayumova E., Haque N. ANALYSIS OF THE CORROSION BEHAVIOR OF THE TINI ALLOY IN THE COARSE-GRAINED STATE // Materials Research Proceedings. 2022. C. 229-236.

3. Magomedova D.K., Churakova A.A., Gunderov D.V. INVESTIGATION OF MECHANICAL PROPERTIES AND FRACTURE SURFACE OF CYLINDRICAL SPECIMENS OF AL 6101 ALLOY UNDER STATIC TENSION // Journal of Physics: Conference Series. 7. 2022. C. 012018.

4. Churakova A.A., Kayumova E.M. MICROSTRUCTURE AND MECHANICAL BEHAVIOR OF A TINI ALLOY DURING MULTIPLE MARTENSITIC TRANSFORMATIONS AND ANNEALING // Russian Metallurgy (Metally). 2022. T. 2022. № 7. C. 727-734.

5. Gunderov, D., Kim, K., Gunderova, S., Churakova, A., Lebedev, Y., Nafikov, R., Derkach, M., Lukashevich, K., Sheremetyev, V., Prokoshkin, S. Effect of High-Pressure Torsion and Annealing on the Structure, Phase Composition, and Microhardness of the Ti-18Zr-15Nb (at. %) Alloy (2023) Materials, 16 (4), № 1754

6. Churakova A.A., Gunderov D.V., Raab G.I., Prokoshkin S.D., Sheremetyev V.A., Filho P.N.L., Pedro J., Claro A.P.R.A. INFLUENCE OF ECAP ON THE STRUCTURE AND PROPERTIES OF TI18ZR15NB AND TI10MO8NB6ZR ALLOYS FOR MEDICAL APPLICATION // IOP Conference Series: Materials Science and Engineering. Synthesis, Structure and Properties of High Entropy Materials. 2021. C. 012006.

7. Churakova A.A., Gunderov D.V., Kayumova E.M. THE INFLUENCE OF MULTIPLE PHASE TRANSFORMATIONS ON FUNCTIONAL CHARACTERISTICS IN TINI ALLOYS IN VARIOUS STRUCTURAL STATES // Journal of Physics: Conference Series. 2021. C. 012008.

8. Churakova A., Gunderov D., Sheremetyev V. REFINEMENT OF Ti18Zr15Nb ALLOY STRUCTURE EXPOSED TO ACCUMULATIVE HIGH-PRESSURE TORSION DEFORMATION // Journal of Physics: Conference Series. 2021. C. 012004.
9. Kayumova E.M., Latypov O.R., Churakova A.A. COMPARISON OF THE CORROSION BEHAVIOR OF THE TiNi ALLOY IN THE COARSE-GRAINED AND ULTRAFINE-GRAINED STATE // Journal of Physics: Conference Series. 2021. C. 012026.
10. Churakova A., Kayumova E., Tolstov N. MICROSTRUCTURE EVOLUTION, FORMATION OF Ti3Ni4 NANOPARTICLES AND NANOTWINS (001)B190 AND INTERRELATION WITH MECHANICAL PROPERTIES IN THE Ti-50.7 AT. % Ni ALLOY DURING MULTIPLE MARTENSITIC TRANSFORMATIONS AND SUBSEQUENT AGING // Materials Today: Proceedings. 2021. C. 1875-1878.
11. Gunderov D., Churakova A., Ramazanov I., Prokoshkin S., Sheremetyev V. EFFECT OF HPT AND ACCUMULATIVE HPT ON STRUCTURE FORMATION AND MICROHARDNESS OF THE NOVEL Ti18Zr15Nb ALLOY // Materials Letters. 2021. T. 283. C. 128819.
12. Sheremetyev V., Derkach M., Prokoshkin S., Churakova A., Gunderov D., Raab G. EFFECT OF ECAP AND ANNEALING ON STRUCTURE AND MECHANICAL PROPERTIES OF METASTABLE BETA Ti-18Zr-15Nb (AT.%) ALLOY // Materials Letters. 2021. T. 305. C. 130760.
13. Ren Z.Q., Wang X., Goel S., Liu S.N., You Z.S., Liu Y., Lan S., Wang J.T., Churakova A.A., Gunderov D.V., Valiev R.Z. ENHANCED TENSILE STRENGTH AND DUCTILITY OF BULK METALLIC GLASSES Zr52.5Cu17.9Al10Ni14.6Ti5 VIA HIGH-PRESSURE TORSION // Materials Science and Engineering: A. 2021. T. 803. C. 140485.
14. Churakova A., Gunderov D. CHANGE OF MICROSTRUCTURE AND ANALYSIS OF FRACTURE OF THE Ti-50.8 AT.% Ni ALLOY IN THE ULTRAFINE-GRAINED STATE AFTER MULTIPLE MARTENSITIC TRANSFORMATIONS WITH A LARGE NUMBER OF CYCLES // Materials Science Forum. 2021. T. 1016. C. 354-358.
15. Gunderov D.V., Asfandiyarov R.N., Raab G.I., Churakova A.A., Astanin V.V. METHOD FOR SLIPPAGE EVALUATION AT VARIOUS STAGES OF HIGH-PRESSURE TORSION AND ITS APPLICATION TO Fe-0.1 % C // Letters on Materials. 2021. T. 11. № 4 (44). C. 416-421.
16. Churakova A., Gunderov D., Kayumova E. THE INVESTIGATION OF MICROSTRUCTURE AND MECHANICAL BEHAVIOR AND THE FRACTOGRAPHIC ANALYSIS OF THE Ti49.1Ni50.9 ALLOY IN STATES WITH DIFFERENT ACTIVATION DEFORMATION VOLUMES // Applied Sciences (Switzerland). 2021. T. 11. № 7. 50.
17. Gunderov D.V., Churakova A.A., Khasanova D.A., Astanin V.V., Ramazanov I.A., Prokoshkin S.D., Sheremetyev V.A. ACCUMULATIVE HIGH-PRESSURE TORSION OF STEEL 316 AND β -Ti ALLOY // IOP Conference Series: Materials Science and Engineering. 2020. C. 012013.
18. Khasanova D.A., Gunderov D.V., Astanin V.V., Gunderova S.D., Churakova A.A., Bazlov A.I., Louzguine-Luzgin D.V. HIGH-PRESSURE TORSION OF Zr-BASED BULK METALLIC GLASSES AND AMORPHOUS MELT-SPUN RIBBONS // IOP Conference Series: Materials Science and Engineering. 2020. C. 012029.
19. Churakova A.A., Gunderov D.V., Tolstov N.E., Magomedova D.K. CALCULATION OF HARDENING CONTRIBUTIONS OF THE TiNi ALLOY UNDERGOING MARTENSITIC TRANSFORMATIONS IN A FREE STATE // IOP Conference Series: Materials Science and Engineering. 2020. C. 012038.
20. Churakova A.A., Kayumova E.M. MECHANICAL PROPERTIES AND FRACTOGRAPHIC ANALYSIS OF THE Ti49.14Ni50.86 ALLOY IN A COARSE-GRAINED STATE DURING MULTIPLE MARTENSITIC TRANSFORMATIONS // Journal of Physics: Conference Series. 2020. C. 012067.
21. Magomedova D.K., Efimov M.A., Churakova A.A., Gunderov D.V., Ryabokon D.V. CRITICAL STRESSES DETERMINATION IN CASE OF PORE FORMATION FOR COARSE- AND ULTRAFINE-GRAINED Al-6101 UNDER STATIC TENSION // Journal of Physics: Conference Series. 2020. C. 012027.

22. Churakova A.A., Gunderov D.V. THE INCREASED STABILITY OF A COARSE-GRAINED AND ULTRAFINE-GRAINED Ti49.15Ni50.85 SHAPE MEMORY ALLOY ACHIEVED WITH MULTIPLE MARTENSITIC TRANSFORMATIONS // IOP Conference Series: Materials Science and Engineering. 2020. C. 022018.
23. Churakova A.A., Gunderov D.V. THE MICROSTRUCTURE AND MECHANICAL CHARACTERISTICS OF THE ALLOY Ti-50.7 AT.%Ni WITH DIFFERENT DEFORMATION PROCESSING DURING MULTIPLE MARTENSITIC TRANSFORMATIONS // IOP Conference Series: Materials Science and Engineering. 2020. C. 022042.
24. Churakova A.A. FUNCTIONAL PROPERTIES AND MICROSTRUCTURE OF TiNi ALLOY DURING MULTIPLE MARTENSITIC TRANSFORMATIONS // IOP Conference Series: Materials Science and Engineering. 2020. C. 012015.
25. Gunderov D.V., Valiev R.Z., Churakova A.A., Asfandiyarov R.N., Astanin V.V., Hahn H. ACCUMULATIVE HPT OF ZR-BASED BULK METALLIC GLASSES // Materials Letters. 2020. T. 261. C. 127000.
26. Gunderov D., Boltynjuk E., Ubyivovk E., Churakova A., Valiev R., Kilmametov A. CONSOLIDATION OF THE AMORPHOUS Zr50Cu50 RIBBONS BY HIGH-PRESSURE TORSION // Advanced Engineering Materials. 2020. T. 22. № 10. C. 1900694.
27. Gunderov D.V., Churakova A.A., Astanin V.V., Asfandiyarov R.N., Hahn H., Valiev R.Z. ACCUMULATIVE HPT OF ZR-BASED BULK METALLIC GLASSES // Journal of Symbolic Logic. 2020. C. 261.
28. Gunderov D., Churakova A., Sitdikov V., Astanin V., Ubyivovk E., Islamov A., Wang J.T. INFLUENCE OF HIGH-PRESSURE TORSION AND ACCUMULATIVE HIGH-PRESSURE TORSION ON MICROSTRUCTURE AND PROPERTIES OF ZR-BASED BULK METALLIC GLASS VIT105 // Metals. 2020. T. 10. № 11. C. 1-14.
29. Churakova A., Gunderov D. MICROSTRUCTURAL AND MECHANICAL STABILITY OF A Ti-50.8 AT.% Ni SHAPE MEMORY ALLOY ACHIEVED BY THERMAL CYCLING WITH A LARGE NUMBER OF CYCLES // Metals. 2020. T. 10. № 2. C. 227.
30. Gunderov, D.V., Churakova, A.A., Polyakov, A.V., Raab, A.G., Gunderova, S.D., Lebedev, Y.A., Claro, A.P.R.A. The Influence of Equal Channel Angular Pressing on Structure and Mechanical Properties of New α - β -Ti Alloy Ti-10Mo-8Nb-6Zr // Russian Journal of Non-Ferrous Metals, 63 (6), pp. 664-670, 2022
31. Gunderov, D.V., Kim, K.A., Churakova, A.A., Sheremet'ev, V.A., Derkach, M.A., Lebedev, Y.A., Raab, A.G. The Structure and Mechanical Properties of the Ti-18Zr-15Nb Alloy Subjected to Equal Channel Angular Pressing at Different Temperatures // Physics of Metals and Metallography, 123 (10), pp. 1031-1040, 2022
32. Churakova, A., Kayumova, E., Gunderov, D., Magomedova, D. Interrelation of microstructure and kinetics of martensitic transformations in TiNi alloy in different structural states under thermal cycling conditions // AIP Conference Proceedings, 2533, статья № 020049, 2022
33. Gunderov, D., Churakova, A., Kiseleva, S., Gunderova, S., Pedro, J., Claro, A.P.R.A. Structure and micro-hardness of titanium alloy Ti10Mo8Nb6Zr after high pressure torsion // AIP Conference Proceedings, 2533, статья № 020013, 2022
34. Gunderov, D.V., Tensile fracture behavior of a Zr-based bulk metallic glass subjected to HPT / Gunderov, D.V., Boltynuk, E.V., Ubyivovk, E.V., Churakova, A.A., Lukyanov, A.V., Raab, A.G., Khasanova, D.A., Churyumov, A.Y. // Letters on Materials. 2016. 6 (4), c. 322-326
35. Gunderov, D., Features of the mechanical behavior of ultrafine-grained and nanostructured TiNi alloys / Gunderov, D., Churakova, A., Lukyanov, A., Prokofiev, E., Pushin, V., Kreitchberg, A, Prokoshkin, S. // Materials Today: Proceedings. 2017. 4 (3), c. 4825-4829
36. Churakova, A., Increase in the dislocation density and yield stress of the Ti50Ni50 alloy caused by thermal cycling / Churakova, A., Gunderov, D. // Materials Today: Proceedings. 2017. 4 (3), c. 4732-4736

37. Ubyivovk, E.V., HPT-induced shear banding and nanoclustering in a TiNiCu amorphous alloy / Ubyivovk, E.V., Boltynjuk, E.V., Gunderov, D.V., Churakova, A., Kilmametov, A.R., Valiev, R.Z. // *Materials Letters*. 2017. 209, c. 327-329
38. Churakova, A. Transformation of the microstructure and properties of ultrafinegrained TiNi alloys during the processing by ECAP-conform via the isothermal regime / Anna Churakova, Dmitry Gunderov, and Georgy Raab // *MATEC WEB OF CONFERENCES*. 2017. 129. 02038
39. Churakova A.A. Effect of thermocycling on the temperatures of phase transformations, structure, and properties of the equiatomic alloy Ti_{50.0}Ni_{50.0} / Churakova A.A., Gunderov D.V. // *The Physics of Metals and Metallography*. 2016. V. 117. № 1. P. 99-106. (DOI: 10.1134/S0031918X15110046, IF=0.794).
40. Lukyanov A. Microstructure transformation in a cast Cu-Fe alloy at high pressure torsion deformation / Lukyanov A., Churakova A., Gunderov D., Filatov A., Antipov E., Sitdikov V., Ganeev A., Valiev R., Pushin V. // *Reviews on Advanced Materials Science*. - 2016. V. 45, Is. 1-2, P. 20-27 (IF=1.245).
41. Churakova A.A. Transformation of the TiNi Alloy Microstructure and the Mechanical Properties Caused by Repeated B2-B19' Martensitic Transformations / Churakova A.A., Gunderov D.V. // *Acta Metallurgica Sinica (English Letters)*. - 2015. V. 28, Is.10, P. 1230-1237. (DOI: 10.1007/s40195-015-0317-6, IF=1.188).
42. Gunderov D.V. Internal friction and evolution of ultrafine-grained structure during annealing of Grade-4 titanium subjected to severe plastic deformation / Gunderov D.V., Churakova A.A., Polyakov A.V., Sitdikov V.D., Golovin I.S. // *The Physics Of Metals And Metallography*. – 2013. V. 114, Is. 12, P.1078-1085. (DOI: 10.1134/s0031918x13120041, IF=0.794).
43. Gunderov D.V. Investigation of the deformation activation volume of an ultrafinegrained Ti50Ni50 alloy / Gunderov D.V., Churakova A.A., Lukianov A.V., Prokofiev E.A., Raab G.I., Prokoshkin S.D., Kreizberg A.Y., Sabirov I.N. // *Russian Physics Journal*. – 2015. V. 58, Is. 6, P.864-868. (DOI: 10.1007/s11182-015-0583-9).
44. Gunderov D.V. Evolution of the amorphous structure in melt-spun Ti50Ni25Cu25 alloy subjected to high pressure torsion deformation / D.V. Gunderov, V.Yu. Slesarenko, A.A. Churakova, A.V. Lukyanov, E.P. Soshnikova, V.G. Pushin, R.Z. Valiev // *Intermetallics*. - 2015. V. 66, P. 77–81. (DOI:10.1016/j.intermet.2015.06.013, IF=2.541).
45. Gunderov D.V. Strain rate sensitivity and deformation activation volume of coarse-grained and ultrafine-grained TiNi alloys / D.V. Gunderov, G. Maksutova, A. Churakova, A. Lukyanov, A. Kreitchberg, G.I. Raab, I. Sabirov, S. Prokoshkin // *Scripta Materialia*, V. 102, 2015, P. 99–102. (DOI:10.1016/j.scriptamat.2015.02.023, IF=3.305).
46. Gunderov D. Stability of an Amorphous TiCuNi Alloy Subjected to High-Pressure Torsion at Different Temperatures / D. Gunderov, V. Slesarenko, A. Lukyanov, A. Churakova, E. Boltynjuk, V. Pushin, E. Ubyivovk, A. Shelyakov, R. Valiev // *Advanced Engineering Materials*. - 2015, V. 17, Is. 12, P. 1728-1732. (DOI: 10.1002/adem.201500216, IF=1.817).
47. Gunderov D. Microstructure and mechanical properties of the SPD-processed TiNi alloys / Gunderov D., Lukyanov A., Prokofiev E., Churakova A.A., Pushin V., Prokoshkin S., Stolyarov V., Valiev R // *Materials Science Forum*. – 2013. V. 738-739, P. 486-490. (DOI: 10.4028/www.scientific.net/MSF.738-739.486, IF=0.410).
48. Gunderov D.V. Evolution of microstructure, macrotexture and mechanical properties of commercially pure Ti during ECAP-conform processing and drawing / Gunderov D. V., Polyakov A. V., Semenova I. P., Raab G. I., Churakova A. A., Gimaltdinova E. I., Sabirov I., Segurado J., Sitdikov V. D., Alexandrov I. V., Enikeev N. A., Valiev R. Z. // *Materials Science and Engineering A – structural materials properties microstructure and processing*, 2013, V. 562, P. 128-136.(DOI:10.1016/j.msea.2012.11.007, IF=2.647).
49. Lukyanov A. Peculiarities of the mechanical behavior of ultrafinegrained and nanocrystalline Ti_{49.4}Ni_{50.6} alloy produced by severe plastic deformation / Lukyanov A., Gunderov D., Prokofiev E., Churakova A., Pushin V. // *Proceeding of conference “Metals 2012” Brno, Czech Republic*. – 2012. P.1335-1341.

50. Free volume measurement of severely deformed Zr 62 Cu 22 Al 10 Fe 5 Dy 1 bulk metallic glass Gunderov, D.V., Boltynjuk, E.V., Sitdikov, V.D., Kilmametov, A.R., Valiev, R.Z. Journal of Physics: Conference Series 1134(1),012010, 2018

51. Features of the surface relief of TiNi alloy in coarse-grained and ultrafine-grained states at room and elevated temperatures Churakova, A.A., Gilmanova, E.F., Gunderov, D.V. 2018, IOP Conference Series: Materials Science and Engineering 447(1),012046

52. High pressure torsion induced structural transformations in Ti- and Zr-based amorphous alloys Gunderov, D.V., Boltynjuk, E.V., Ubyivovk, E.V., Kilmametov, A.R., Valiev, R.Z. 2018 IOP Conference Series: Materials Science and Engineering 447(1), 012052

53. Microstructure transformation and physical and mechanical properties of ultrafine-grained and nanocrystalline TiNi alloys in multiple martensitic transformations B2-B19' [Gefügeumwandlung sowie physikalische und mechanische Eigenschaften von ultrafeinkörnigen, nanokristallinen TiNi-Legierungen unter verschiedenen martensitischen Umwandlungen B2-B19']

Churakova, A.A., Gunderov, D.V., Dmitriev, S.V. 2018 Materialwissenschaft und Werkstofftechnik 49(6), c. 769-783

Projects

RFBR project No. 20-08-00497 A "Features of the deformation behavior of bulk metal glasses subjected to IPDK and other influences modifying the amorphous structure" - performer (2020-2022)

RFBR project No. 19-58-80018 BRICS_t "Development of new titanium alloys using ECAP and surface treatment" - performer (2019-2021)

RFBR project No. 19-58-45014 IND_a "Evolution of the plasticity of bulk amorphous alloys based on Zr under intense plastic deformation and other external influences" - performer (2019-2021)

RFBR Project 17-08-00974 A "Influence of intensive plastic deformation on the microstructure and properties of amorphous alloys produced at significantly different free energy" - performer (2017-2018).

RFBR Project 16-38-00242 mol_a "Features of deformation mechanisms of ultrafine-grained and nanocrystalline TiNi alloys at different temperatures" - head (2016-2017).

RFBR Project 15-08-04784 A "Transformation of the structure and properties of ultrafine-grained and nanocrystalline TiNi alloys under multiple martensitic transformations" - performer (2015-2016)

Project RSF 14-12-00138 "Formation of the structural state of" nanostructure "by intensive plastic deformation of initial amorphous alloys" - performer (2014-2016).

Project RSF №14-19-01062 "Creation of scientifically grounded methods realizing combined shear schemes in the conditions of super-large single deformations of metallic materials" - performer (2014-2016).

Head of the grant of the President of the Republic of Bashkortostan for young scientists – 2019

Project RSF № 20-72-00075 "The improving the functional and microstructural stability of coarse-grained and ultrafine-grained SME TiNi alloys achieved by the nanoparticles during multiply martensitic transformations and low-temperature aging" - head