



PERSONAL INFORMATION

AGELMENEV MAXUT ELTAEVICH



📍 Republic of Kazakhstan, city of Karaganda, Universitetskaya street, 28, Karaganda University named E.A. Buketov

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🔗 Research ID V-2367-2018

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| Date of birth: 03/05/1958.

PLACE OF WORK, POSITION

Professor of the Department of Physics and Nanotechnology

SCIENTIFIC DEGREE, SCIENTIFIC TITLE (ACADEMIC DEGREE)

PhD of physics- mathematical science, The Doctor of chemical sciences, Full Professor

WORK EXPERIENCE

Place and date

December 2016 - now **Academician Y.A.Buketov Karaganda State University,
Professor of the Physics and Nanotechnology Department**

March 2016- East Kazakhstan State University named after S.Amanzholov
Head of National scientific laboratory of collective, Republic of Kazakhstan,

November 2016 Professor of the Physics and Technology Department

**October 1988.- August . 2015 The institute of organic synthesis and chemistry of coal of the
Republic of Kazakhstan
(Karaganda s.) (IOSU)**

Job positions - from senior engineer to the head of the Spectroscopy Laboratory

Description of research:

The investigations in the field of physical chemistry of liquid crystals. Direct involvement in the setting up and start-up equipment for the analysis of physical-chemical analysis of organic compounds (NMR, IR, UV, ESR spectroscopy, electrophysical and microscopic investigations), experimental and quantum-chemical researches in the field of liquid crystals. The investigation was devoted to development and research of a new class of liquid crystals on the basis of arylpropargyl ethers of phenols. Understanding of improvement ways of arylpropargyl ethers of phenols mezogen properties is impossible without studying correlation between structure and physico-chemical characteristics. The influence of the same functional groups on mezogen is different at various liquid crystal (LC) classes. The research purpose consist in formation of scientific bases of controlling of mezogen properties of arylpropargyl ethers of phenols by means of experimental and theoretical study of influence of structural transformations on the physical-chemical characteristics for development of a new class of liquid crystals on their basis. The structural transformation of research molecules was carried out by joining of functional groups to the benzene ring connected indirectly with triple bond 's carbon connection. At researches experimental (IR, UV, NMR and EPR spectroscopy, polarization pictures, electrical methods) and theoretical (quantum chemistry, molecular mechanics) methods were used. There were received liquid crystal mixtures with the melt temperature equal to 20 °C, the temperature interval of mesomorphic phase existence equal to 90 °C with positive $\Delta\epsilon$ on the basis of which it is possible to receive LC materials perspective from the commercial point of view.

We have been initiated research in the field of liquid crystals computer modeling since 2000. Directed search for effects occurring in nanocomposites with liquid crystals, requires knowledge of the interaction nature of these components. The research on computer modeling of the LC molecules behaviour has been conducted in the presence of various carbon nanostructures under the influence of temperature and external electric field. Our method of molecular dynamics in the liquid state approximation was also used. The developed method allows simulating the physical and chemical properties of individual LC molecules, as well as nanocomposites with their participation. It has been established that under the influence of electric field in the nanocomposite materials, the occurrence of biaxial states and the demonstration of the optical shutter properties are possible. It has been presented that the dimers decay and stream of LC define the dynamic behavior of LC located inside and outside of the CNT under the influence of temperature and electric field. It was detected that the spatial distribution of molecules relative to the CNT depends on the mesomorphism type, and the greatest variety of positions is observed for the nematic phase. Moreover, it was established that the perpendicular position of nanotubes eliminates movement of molecules of smectic LC on the second CNT surface. It is found that different CNT types will be well dispersed in

nematic liquid crystals. It allows using different CNT types in creating nanocomposite structure with participation of LC. Funding for this research was carried out in the framework of the grant funding for research in the Republic of Kazakhstan.

The latest project "Preparation and research of physical-chemical properties of nanocomposite materials based on nematic liquid crystals, carbon nanotubes and fullerene molecules" has received grant funding. However, the reduction of funding has not allowed its implementation in full

Participation in conferences – 9 ECLC (Lisbon, 2007), 22 ILCC (Jeju Jeju 2008), 23 ILCC (Krakow 2010), 25 ILCC (Dublin 2014)

1983-1988 Physical Institute of Scientific Academy of USSR of the name of P. N. Lebedev (Moscow), the luminescence laboratory of the name of S.I.Vavilova. *Research assistant, postgraduate student*

The zinc selenide single crystal with hole conduction grown under equilibrium conditions first experimentally was investigated. The results of this research (excitonic photoluminescence polarization and kinetics of the luminescence excitation spectra, thermoelectric power, Hall effect, the temperature dependence of conductivity) have established that the active optical and electrical centers connected by alkali metal.

1980-1983 - Lecturer at the Department of Thermophysics

EDUCATION AND PROFESSIONAL TRAINING

– 25 September 2009 Full Professor

Supervised Ph.D. students

1 K.T. Bazhikov "The research of physical and chemical properties of liquid crystal in terms of acetylene compounds", Karaganda state University of the name of Buketov E.A. (KarGU), Kazakhstan, 2002 (condensed matter physics)

2 V.G. PAK "Modeling of behaviour of arylpropargyl ethers of phenols with negative meanings of dielectric permeability anisotropy", KarGU, Kazakhstan, 2008 (physical chemistry)

3 S. M. Bratukhin "The modelling of physical and chemical properties of the arylpropargyl ethers of phenols and unsymmetrically 1,1'-bis substituted ferrocene", KarGU, Kazakhstan, 2010 (physical chemistry)

2001-2004 The institute of organic synthesis and chemistry of coal of the Republic of Kazakhstan (Karaganda s.) (IOSU)

The Doctor of chemical sciences

Doctoral dissertation theme - "*Controlling of mezogen properties of arylpropargyl ethers of phenols*" (physical chemistry)

Education

Work was conducted in the Institute of organic synthesis and chemistry of coal of the Republic of Kazakhstan (Karaganda s.) and was defended in Karaganda State University (KarGU) Kazakhstan in 2003.

April 1985-April 1988 Physical Institute of Scientific Academy of USSR of the name of P. N. Lebedev

(Moscow), the luminescence laboratory of the name of S.I.Vavilova.,

PhD of physics- mathematical science

PhD theme – "Electrically and optically active centers in the zinc selenide connecting by the alkali metals" (physics of dielectrics and semiconductors)

April 1983- April 1985 Physical Institute of Scientific Academy of USSR of the name of P. N. Lebedev, Moscow

Research assistant in the luminescence laboratory of the name of S.I.Vavilova

1975-1980 The Karaganda State University, Department of Physics, USSR, Undergraduate degree in Physics, Graduated with first class diploma

1965-1975 The secondary school № 63 in Karaganda, Kazakhstan (gold medal)

**Professional trainings,
Scientific trips**

- **1980 1-3.07** Scientific-practical conference dedicated to the 60th anniversary of the Kazakh SSR and the Communist Party of Kazakhstan, Karaganda
- 1986 October III All-Union Conference "Physics and technology of wide-gap semiconductors ", Makhachkala
- 1991, 25.09-5.10 I All-Union Conference on Theoretical Organic Chemistry. Volgograd
- 1991 October III All-Union Conference "Materials Science of Chalcogenide Semiconductors", Chernivtsi
- 1997 26-27 June International scientific conference "Scientific and technological progress - the basis for the development of a market economy", Karaganda
- 1999 29-30 June International Scientific Conference "Science and Education - the Leading Factor of the Strategy" Kazakhstan 2030 "" , Karaganda
- 2000 27-28 June International Scientific Conference "Science and Education - the Leading Factor of the Strategy" Kazakhstan 2030 "" , Karaganda
- 2004 15-16 September International Scientific and Theoretical Conference "Molecular Spectroscopy and Quantum Chemistry of Organic Compounds", Karaganda
- 2005 11-12 March International Scientific and Practical Conference "Physicochemical Processes in Gas and Liquid Media", Karaganda
- 2005 27.06-2. 07 XV International Conference on Chemical Thermodynamics in Russia. –Moscow
- 2005 23.12 International Scientific and Practical Conference "Modern Scientific Works of Young Scientists" Astana
- 2006 4-5.05 International Scientific and Practical Conference "Modern Problems of Organic Synthesis, Electrochemistry and Catalysis" Karaganda
- 2006 25-26.09 International Forum "Assessment of the scientific potential and priority directions of development of science and its transformation into a decisive factor in Kazakhstan's entry into the 50 competitive countries of the world" Astana
- 2006 21-22.09 3rd International Conference on Theoretical and Experimental Chemistry Karaganda
- 2006 23-24.10 International scientific and practical conference "Industrial and innovative development - the basis of a sustainable economy of Kazakhstan" Shymkent
- 2007 26-30.03 XIII International Scientific and Practical Conference of Students, Postgraduates and Young Scientists "Modern Techniques and Technologies" Tomsk, Russia
- 2007 26-28.06 XXVII Russian School of Science and Technology Miass, Russia
- 2007 20-22.04 International scientific and practical conference "Valikhanov readings - 12", Kokshetau
- 2007 2-6.07 9th European Conference on Liquid Crystals Lisbon, Portugal
- 2007 9-12.10 5th International Scientific Conference "Modern Achievements of Physics and Fundamental Physical Education", Almaty
- 2008 29.06-4.07 22nd International Liquid Crystals Conference, Jeju Island Korea
- 2008 2-3.10 6th International Beremzhanov Congress on Chemistry and Chemical Technology, Karaganda
- 2008 OCTOBER International scientific-practical conference "Current state and prospects for the development of science, education in Central Kazakhstan." Karaganda
- 2009 21-22.04 International Scientific and Practical Conference "Chemistry - XXI Century: New Technologies, New Products" Kemerovo, Russia
- 2009 16-18.09 International Scientific and Technical Conference "Science, Education, Innovation: Priority Areas of Development" Bishkek, Kyrgyzstan
- 2010 9-16.07 23 International Liquid Crystals Conference, Krakow Poland
- 2010 4-5. 10 4th International Conference on Theoretical and Experimental Chemistry dedicated to the 80th anniversary of M.I.Bakeev Karaganda
- 2012 28.02-2.03 II-nd International Kazakh-Russian Conference on Chemistry and Chemical Technology Karaganda
- 2013 JUNE International school-seminar "Innovative technologies and research aimed at the development of green energy and deep processing of products" Ust-Kamenogorsk
- 2013 OCTOBER International Scientific and Practical Conference "Science and Education in Central Kazakhstan" Karaganda
- 2014 29.06-4.07 25 International Liquid Crystals Conference, Dublin, Ireland
- 2014 24-27.09 5th International Scientific Conference "Theoretical and experimental chemistry"

SKILLS DEVELOPMENT INFORMATION

Certificate No. 413017 on passing the course "Actual problems of general, theoretical and applied physics"

KarSU, Karaganda 2017 20-25.02

PERSONNEL QUALITIES

Native language **Kazakh Russian**

LANGUAGE	UNDERSTANDING		SPEAKING	WRITING
	Hearing	Reading	Oral speech	
English	B1	B1	B1	B1
IELTS, Academic, Centre Number KZ004, Date 29sep2018, Candidate number 001490				

Digital skills PC/WINDOWS NT, MICROSOFT OFFICE, MOPAC. GROMACS, LADY

Other skills (hobbies) Charity, reading, questions of the spiritual foundations and personal fulfillment, music, painting, sports, dance, contemporary literature
Experience in the study of photoluminescence at low temperatures, NMR, IR, UV,EPR studies, the electrical measurements, polarization-microscopic studies
Calculation and analysis of quantum-chemical studies as well as the methods of molecular dynamics in the approximation of a liquid aggregate state and simulation of IR spectra. I have the experience of solving boundary value problems (diploma work)

ADDITIONAL INFORMATION

TEACHING EXPERIENCE

- 2016.12 - now** **Academician Y.A.Buketov Karaganda State University**
Teaching subjects:
«Principles of nanotechnology»
«Nuclear Magnetic Resonance Spectroscopy»
«Computer Modeling in Nanomaterials Investigation»
«Electrodynamics and special theory of relativity»
«Computing modeling of physical processes using MathCAD»
«Физика»
- 2016.02-2016.11** - East Kazakhstan State University named after S.Amanzholov
Teaching subjects:
General course of physics, Nuclear Magnetic Resonance Spectroscopy
- 2004 -2008** Professor of the Kazakh-Russian University
Teaching subjects:

2001- 2004

General course of physics, electrical engineering course, basic computer science course
The institute of organic synthesis and chemistry of coal of the Republic of Kazakhstan

1980 -1983

Assistant professor
The Karaganda State University, Department of Physics,
Teaching subjects:
Mechanics

143 scientific works including one monograph, one tutorial

Annex 1

The most significant scientific works:

1. M. E. Agelmenev, A.D. Levit, E.I. Panasjuk, N.V.Serdjuk. Growing and luminescent properties of bulk crystals of undoped zinc selenide with p-type conductivity // *Izv.AN SSSR (USSR).Neor.Mat.* – 1986.-Vol.22, №3.- P.387-391. (Russian).
2. M. E. Agelmenev, A. N. Georgobiani, Z.P.Iljuhina. M.S.Kleybanov, A.D. Levit, L. S. Lepnev. The relationship of the exciton and the long-wavelength ($\lambda \sim 500$ nm) luminescence of zinc selenide containing alkali metals // *Kratkii soobchenija po fizike/ FIAN SSSR (USSR)–1986.-№9.* – P.37-39. (Russian).
3. M. E. Agelmenev, A. N. Georgobiani and L. S. Lepnev. Depolarization of zinc selenide luminescence // *J. Applied Spectroscopy.* – 1989. - Vol. 50, №3. - P. 262-267.
4. M. E. Agelmenev, A. N. Georgobiani, Z.P.Iljuhina. M.S.Kleybanov, A.D. Levit, L. S. Lepnev. The luminescence of zinc selenide doped by alkali metals // *Izv.AN SSSR (USSR).Neor.Mat.* – 1989.- Vol.25, №5. – P.731-736. (Russian).
5. A. N. Georgobiani, A.D. Levit, M.S.Kleybanov, L. S. Lepnev, M. E. Agelmenev. The equilibrium composition of ZnS and ZnSe crystals doped by Li, coexisting with vapors of zinc and selenium // *Izv.AN SSSR (USSR).Neor.Mat.* – 1989.-Vol.25,№12. - P.1978-1982. (Russian).
6. Z. M. Muldakhmetov, M. E. Agelmenev, K. T. Bazhikov and S. A. Shchelkunov. Electrooptical properties of the bis(phenylpropargyl) diether of hydroquinone// *J. Applied Spectroscopy.* -1992.- Vol. 56, №5-6. - P. 432-435.
7. M. E. Agelmenev, Z. M. Muldakhmetov, K. T. Bazhikov. The electro-optical properties of a new class of liquid crystals based on acetylenic compounds // *Izv.NAN RK (Kazakhstan). Ser.Chem.-1994.* - №2- P.70-74. (Russian).
8. M. E. Agelmenev, K.T.Bazhikov, Z. M. Muldakhmetov, M.Yu.Sizykh. Effect of the Nature of Halogen on the Acetylene Compounds // *Russian J. Phys. Chem..* – 2002.. - Vol. 76, № 10.. – P.1713-1714.
9. Z. M. Muldakhmetov, M. E. Agelmenev, E. S. Sovetov. Effect of substituents on the mesomorphism of acetylene compounds // *Russian J. Phys. Chem..* - 1999. - Vol.73, №11.. - P. 1881-1882..
10. Z. M. Muldakhmetov, M. E. Agelmenev. The nature of mesomorphism in acetylenic compounds // *Doklady Nacionalnoy Akademii Nauk Respubliki Kazakhstan.* - 2000. - №6. - P.43-46 (Russian).
11. M. E. Agelmenev The dielectric study of liquid crystals based on propargyl ethers containing acetylenyl // *Izv.NAN RK (Kazakhstan). Ser.Chem..-2002.- -№4.-* - P.45-49. (Russian).
12. M. E. Agelmenev. The inversion the sign of the dielectric anisotropy of the mesogenic propargyl ethers containing acetylenyl // *Izv.NAN RK (Kazakhstan). Ser.Chem.- 2002. -- №5. –P.20-26.*
13. M. E. Agelmenev. Influence of functional group NO₂ for properties of liquid crystals based on propargyl ethers containing acetylenyl // *Izv.NAN RK (Kazakhstan). Ser.Chem.-2002.- №5. –P.35-38.* (Russian).
14. M. E. Agelmenev. The mesogenic properties of liquid crystals based on propargyl ethers containing acetylenyl in the presence of halogen atoms // *Izv.NAN RK (Kazakhstan). Ser.Chem.- 2002. - №6. – P.48-51.* (Russian).
15. M. E. Agelmenev. Aggregation in binary mixtures of liquid crystals // *Izv.NAN RK (Kazakhstan). Ser.Chem.- 2002.-№6.-P. 61-67.* (Russian).
16. M. E. Agelmenev. Controlling of the optoelectronic materials properties (liquid crystals, semiconductors A2B6), Karaganda: IOSU, 2002, 198 P. (Russian).
17. Z. M. Muldakhmetov, M. E. Agelmenev., S. M. Bratukhin, V. G. Pak, V. V. Polikarpov, and O. A. Yakovleva. Computer modeling of the behavior of nematic liquid crystals with negative dielectric anisotropy // *Doklady Nacionalnoy Akademii Nauk Respubliki Kazakhstan.* -2007. - №5. - P. 68-76. (Russian).
18. M. E. Agelmenev, Z. M. Muldakhmetov, S. M. Bratukhin, V. G. Pak, V. V. Polikarpov, and O. A. Yakovleva. Computer Simulations of the Behavior of Arylpropargyl Phenol Esters// *Russian J. Phys. Chem. A.* – 2008. - Vol. 82, No. 5. - P. 784–788.
19. Agelmenev M.E., Muldakhmetov Z.M., Bratukhin S.M., Pak V.G., Polikarpov V.V., Yakovleva O.A The dynamics of some nematic liquid crystals // *Molecular Crystals and Liquid Crystals- 2008- Vol. 494- P. 339–352.*
20. M.E. Agelmenev, Z. M. Muldakhmetov, S. M. Bratukhin, V. G. Pak, V. V. Polikarpov, O. A. Yakovleva, T.B.Shakitaeva. Modeling the behavior of the nematic liquid crystals cluster by Gromacs // *Vestnik KazNU name al-Farabi., Ser. Phys.* – 2007. – Vol.. 24, №2. - P. 103-108. (Russian).
21. Agelmenev M.E., Muldakhmetov Z.M., Bratukhin S.M., Pak V.G., Polikarpov V.V., Yakovleva O.A The dynamics of some nematic liquid crystals // *Molecular Crystals and Liquid Crystals- 2008- Vol. 494- P. 339–352.*
22. M. E. Agelmenev, S. M. Bratukhin, Z. M. Muldakhmetov, V. V. Polikarpov. Mesogenic System Simulation in the Liquid State of Aggregation // *Russian J. Phys. Chem.. A* - 2010. - Vol. 84, № 7. - P.1158–1162.
23. M.E. Agelmenev, Z. M. Muldakhmetov, S. M. Bratukhin, V. V. Polikarpov, V. G. Pak. Effect "crystallization" in clusters of molecules containing a fluorine atom // *Izv.NAN RK (Kazakhstan). Ser.Chem.- 2009.- №4. - P.36-39.* (Russian).
24. M. E. Agelmenev, S. M. Bratukhin, Z. M. Muldakhmetov, V. V. Polikarpov and O. A. Yakovleva. Modeling of structure and interpretation of IR absorption spectra for crystals of substituted arylpropargyl ethers of phenols // *J. Applied Spectroscopy.* - 2009.- Vol.76, №5. - P. 646-655.
25. M.E. Agelmenev, Z. M. Muldakhmetov, S. M. Bratukhin. Computer modeling of physical and chemical properties of substances: Overview// *Doklady Nacionalnoy Akademii Nauk Respubliki Kazakhstan.* – 2010. – №5. – P.41-57. (Russian).

Participation in the implementation of scientific projects

Participant in grant projects of the Institute of Organic Synthesis and Coal Chemistry (Karaganda) from 1996-2015, and EKSU named after S. Amanzholov (Ust-Kamenogorsk) 2015.10 to 2016.10

Membership in professional scientific organizations

Member of the International Society of liquid crystals
Member of the Public Association "Peace through Spirituality"

Awards and titles

Courses

«Principles of nanotechnology»
«Nuclear Magnetic Resonance Spectroscopy»
«Computer Modeling in Nanomaterials Investigation»
«Electrodynamics and special theory of relativity»
«Computing modeling of physical processes using MathCAD»
«Physics»
Quantum mechanics

Professional and scientific interests

Physical chemistry of electronic materials, in particular the ability to control and modification of their physicochemical properties. Recently, the objects of study are nanocomposites based on liquid crystals, carbon nanotubes, fullerene molecules, graphene

SCIENTIFIC DATABASES IDENTIFIERS

Researcher ID: V-2367-2018
ORCID ID: 0000-0002-4083-4443
Author ID Scopus: 6603494993
Clarivate Analytics, Researcher ID G-9769-2012

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