

Khachik T. Nazaretyan

Date of birth: Aragatsotn region, Armenia, 28 April 1990
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EDUCATION

01.09.2014-30.05.2016 Master student in Chemistry, Department of Chemistry, Yerevan State University

01.09.2008-30.05.2012 BSc in Chemistry, Department of Chemistry, Yerevan State University.

RESEARCH & WORKING EXPERIENCE

2014-2016 Laborant at the Laboratory of Kinetics of SHS processes, Institute of Chemical Physics, National Academy of Sciences of RA

2014 -2015 Security officer

2016-2021 Junior researcher at the Laboratory of Kinetics of SHS processes, Institute of Chemical Physics, National Academy of Sciences of RA

2021- Researcher at the Laboratory of Kinetics of SHS processes, Institute of Chemical Physics, National Academy of Sciences of RA

AWARDS

- 2020** ARPA Institute Invention Competition, IV place award
- 2018** ARPA Institute Invention Competition, IV place award
- 2017** ARPA Institute Invention Competition, I place award

Projects

- 2023** Incubation program (is implemented by Enterprise Incubator Foundation by the contributions from PMI Science), « High Entropy Refractory Ceramic by Combustion Synthesis», researcher.
- 2022** ISTC GE#2506 “Scientific substantiation of the possibility of creating new bactericidal zeolite filter materials for purification-decontamination water from various sources”, Researcher.
- 2022** US Office of Naval Research Grant N62909-22-1-2068 - “Degradation of Ultra High Temperature Materials under Extreme Conditions”, Researcher.
- 2021** Faculty research grant (is implemented by Enterprise Incubator Foundation by the contributions from PMI Science) “High-entropy (FeCoNiMnCu)O oxide by solution combustion synthesis and spark plasma sintering for magnetic applications”, Researcher
- 2020** research grant from State Committee of Science of the Republic of Armenia, Project no. 20TTWS-2F040 “High entropy oxides by combustion synthesis and their sparkyconsolidation for magnetic and electrochemical applications”
Researcher

- 2019** Faculty research grant (is implemented by Enterprise Incubator Foundation by the contributions from PMI Science) “Refractory high entropy alloys for high-temperature application” Researcher
- 2019** research grant from the Armenian National Science and Education Fund (ANSEF), (Project no. cheminorg-5246) “Preparation of Ti6Al4V alloy by self-propagating high-temperature synthesis for 3D printing” Researcher
- 2019** research grant from State Committee of Science of the Republic of Armenia, Armenian-Belarusian project (Project no. 18BL-011) “The influence of Structure formation and properties of SHS-intermetallic materials with nanoadditives using ultrasonic activation” Researcher
- 2018** research grant from State Committee of Science of the Republic of Armenia, (Project no. 18T-1D051) Researcher
- 2015** State Committee of Science of the Republic of Armenia (Project no. 15T-1d196) Research Grant, researcher

LANGUAGES

Armenian (native), Russian (good)

COMPUTER SKILLS

MS Office, Photoshop,
MS Jade, ISMAN-Thermo software.

PUBLICATIONS, Articles

1. S. Aydinyan, H. Kirakosyan, O.Niazyan, M. Tumanyan, Kh. Nazaretyan, S. Kharatyan, Reaction pathway in the $\text{WO}_3\text{-CuO-Mg-C}$ system at nonisothermal conditions, *Armenian Journal of Physics*, 2016, vol. 9, issue 1, pp. 83-88.
2. H.V. Kirakosyan, Kh.T. Nazaretyan, Kh.Gh. Kirakosyan, M.E. Tumanyan, S.V. Aydinyan, S.L. Kharatyan. "Nanosize Molybdenum Carbide Preparation by Sol-Gel Combustion Synthesis with Subsequent Fast Heating", *Chem. J. Armenia*, 2017, vol.70, No.1-2, pp 11-19
3. S.V. Aydinyan, Kh.T. Nazaretyan, A.G. Zargaryan, M.E. Tumanyan, S.L. Kharatyan. "Reduction Mechanism of $\text{WO}_3\text{+CuO}$ Mixture by Combined Mg/C Reducer. Non Isothermal Conditions: High Heating Rates", *J Thermal Analysis & Calorimetry*, 2018, vol.133, issue 1, pp.261-269.
4. Kirakosyan, H. V., Kh T. Nazaretyan, R. A. Mnatsakanyan, Sofiya V. Aydinyan, and S. L. Kharatyan. "Solution combustion synthesis of nanostructured molybdenum carbide." *Journal of Nanoparticle Research* 20, no. 8 (2018): 214.
5. Khachatur V. Manukyan, Khachik Nazaretyan, Christopher E. Shuck, Hakob A. Chatilyan, Sergei Rouvimov, Suren L. Kharatyan, and Alexander S. Mukasyan. "Kinetics and Mechanism of Ignition in Reactive Al/Ni Nanostructured Materials". *The Journal of Physical Chemistry C*, 2018, 122 (47), pp.27082-27092.
6. Kamboj N, Aghayan M, Rubio-Marcos F, Nazaretyan K, Rodríguez MA, Kharatyan S, Hussainova I. Nanostructural evolution in mesoporous networks using in situ High-Speed Temperature Scanner. *Ceramics International*. 2018 Aug 1;44(11):12265-72.
7. Nazaretyan KT, Kirakosyan HV, Aydinyan SV, Zakaryan MK, Abovyan LS, Kulak M, Khina B. The influence of high-energy ball milling and nanoadditives on the kinetics of heterogeneous reaction in Ni-Al system. In *IOP Conference Series: Materials Science and Engineering* 2021 May 1 Vol. 1140, No. 1, p. 012052. IOP Publishing, doi:10.1088/1757-899X/1140/1/012052
8. Zakaryan, M., Nazaretyan, K., Aydinyan, S., & Kharatyan, S. (2021). Joint Reduction of NiO/ WO_3 Pair and NiWO_4 by Mg+ C Combined Reducer at High Heating Rates. *Metals*, 11(9), 1351.
9. Zakaryan, M. K., Nazaretyan, K. T., Aydinyan, S. V., & Kharatyan, S. L. (2021). NiO reduction by Mg+ C combined reducer at high heating rates. *Journal of Thermal Analysis and Calorimetry*, 146, 1811-1817.
10. H.V. Kirakosyan, Kh. Nazaretyan, S.V. Aydinyan, S.L. Kharatyan. The Mechanism of Joint Reduction of MoO_3 and CuO by Combined Mg/C Reducer at High Heating Rates. *J. Compos. Science*, 2021, v. 5(12), p. 318. doi.org/10.3390/jcs5120318
11. Nazaretyan K., Kirakosyan H., Zakaryan M., Abovyan L., Volobujeva O., Aydinyan, S. (2022). The Interaction Pathway in the Mechano-Ultrasonically Assisted and Carbon-Nanotubes Augmented Nickel–Aluminum System. *Metals*, 2022, 12(3), 436.
12. Zakaryan, M., Nazaretyan, K., Aydinyan, S., & Kharatyan, S. (2022). Kinetic Highlights of the Reduction of Silver Tungstate by Mg+ C Combined Reducer. *Metals*, 12(6), 1000.
13. Nazaretyan, K., Aydinyan, S., Kirakosyan, H., Moskovskikh, D., Nepapushev, A., Kuskov, K., ... & Kharatyan, S. (2023). AlCo-rich AlCoNiFe and AlCoNiFeCr high entropy alloys: synthesis and interaction pathway at high heating rates. *Journal of Alloys and Compounds*, 167589. <https://doi.org/10.1016/j.jallcom.2022.167589>

14. Kuskov, K. V., Nepapushev, A. A., Aydinyan, S., Shaysultanov, D. G., Stepanov, N. D., Nazaretyan, K., ... & Moskovskikh, D. O. (2023). Combustion Synthesis and Reactive Spark Plasma Sintering of Non-Equiatomic CoAl-Based High Entropy Intermetallics. *Materials*, 16(4), 1490.
15. Zakaryan, M. K., Amirkhanyan, N. H., Nazaretyan, K. T., Kharatyan, S. L., & Manukyan, K. V. (2023). Combustion synthesis mechanism of the Ni (NO₃)₂ hexamethylenetetramine solutions to prepare nickel nanomaterials. *Combustion and Flame*, 257, 113049.
16. H. Kirakosyan, Kh. Nazaretyan, N. Amirkhanyan, H. Beglaryan, S. Aydinyan A Novel Pathway of Solution Combustion Synthesis of Silicon Carbide and SiC Based Composite Whiskers, AIP Conf. Proc., 2989, 2024, 040009, <https://doi.org/10.1063/5.0189204>
17. H. Kirakosyan, Kh. Nazaretyan, A. Kharatyan, S. Aydinyan, The Preparation of High-Entropy Refractory Alloys by Aluminothermic Reduction Process, AIP Conf. Proc., 2989, 2024, 040012, <https://doi.org/10.1063/5.0189206>

CONFERENCES & SYMPOSIUMS

1. S. Aydinyan, H. Kirakosyan, O.Niazyan, M. Tumanyan, Kh. Nazaretyan, S. Kharatyan, Reaction pathway in the WO₃-CuO-Mg-C system at nonisothermal conditions, Abstract, ISTC International workshop " Ionizing and Non-Ionizing Radiation Influence on Structure and Biophysical Properties of Living Cells", Tsakhkadzor, 25-28 September, 2015, pp.94-95.
2. Kh. Nazaretyan, H. Kirakosyan, S. Aydinyan, S. Kharatyan. "Preparation of Nanosize Mo₂C by Combining Solution Combustion Synthesis with Subsequent Fast Heating", Abstract, Journal of Thermal Analysis and Calorimetry (JTAC), 2017, June 6-9, Budapest, Hungary, p.58.
3. Kh. Nazaretyan, A. Zargaryan, S. Aydinyan, S. Kharatyan, Study of reduction mechanism of WO₃+CuO mixture by combined Mg/C reducer – influence of high heating rate. Abstract, Journal of Thermal Analysis and Calorimetry (JTAC), 2017, June 6-9, Budapest, Hungary, p.206.
4. Kh. Nazaretyan, H. Kirakosyan, S. Aydinyan, S. Kharatyan. "Nanosized molybdenum carbide synthesized by Solution Combustion Synthesis with Subsequent thermal treatment", XIV International Symposium on Self-Propagating High Temperature Synthesis, 25-28 September, 2017, Tbilisi, Georgia
5. Kh. Nazaretyan, H. Kirakosyan, S. Aydinyan. "Copper molybdate reduction by combined Mg/C reducer", V Scientific Conference of the Armenian Chemical Society (with international participation), Erevan, 2017, Oct. 3-7
6. H. Kirakosyan, Kh. Nazaretyan, Sofiya Aydinyan, Manvel Tumanyan, Suren Kharatyan. A New Synthesis Pathway for Molybdenum Carbide Nanopowder by Solution Combustion. The International Conference Dedicated to the 50th Anniversary of Self-Propagating High Temperature Synthesis (SHS-50), Chernogolovka, Russia, 2017, Nov. 20-21.
7. H.V. Kirakosyan, Kh.T. Nazaretyan, S.L. Kharatyan, Novel approach for Cu-Mo pseudoalloys preparation, V International Conference "Current problems of chemical physics", 25-29 September, 2018, Yerevan, Armenia.

- 8- M.K. Zakaryan, Kh.T. Nazaretyan, O.M. Niazyan, S.L. Kharatyan, Kinetics of Nickel Oxide Reduction by Mg/C Combined Reducer at Non-Isothermal Conditions, V International Conference “Current problems of chemical physics” 25-29 September, 2018, Yerevan, Armenia, pp. 78-79.
9. Kh. Nazaretyan, H. Kirakosyan, S. Aydinyan, “Preparation of Mo-Cu pseudoalloy from CuMoO_4 precursor by combining sol-gel method and SHS”, XV International Symposium on Self-Propagating High Temperature Synthesis, 16-20 September, 2019, Russia, Moscow, pp.165-168.
10. Kh. Nazaretyan, M. Zaqaryan, S. Aydinyan, S. Kharatyan “Joint Reduction of $\text{NiO}+\text{WO}_3$ Oxides by Combined Mg/C Reducer. Synergetic Effect”, XV International Symposium on Self-Propagating High Temperature Synthesis, 16-20 September, 2019, Russia, Moscow, pp. 546-548
11. Kh. Nazaretyan, H. Kirakosyan, S. Aydinyan, “Solution combustion synthesis of copper molybdate nanopowder”, VI Scientific Conference of the Armenian Chemical Society, Erevan, 2019, oct. 7-12
12. Kh. Nazaretyan, H. Kirakosyan, S. Aydinyan, “Preparation of Ti-Al-V alloy by self-propagating high-temperature synthesis”, VI Scientific Conference of the Armenian Chemical Society, Erevan, 2019, oct. 7-12
13. Kh T Nazaretyan, H V Kirakosyan, S V Aydinyan, M K Zakaryan, L S Abovyan, M Kulak, B Khina, The influence of high-energy ball milling and nanoadditives on the kinetics of heterogeneous reaction in Ni-Al system, Modern Materials and Manufacturing (MMM-2021), April 27-29, Tallinn, Estonia
14. K. Nazaretyan, M. Tumanyan, D. Moskovskikh, A. Nepapushov, S. Aydinyan, S. Kharatyan, Kinetic Studies of High Entropy FeNiAlCo and FeNiAlCoCr Alloys Formation at High Heating Rates, 15th International Ceramics Congress, CIMTEC 2022, June 20-24, 2022, Perugia, Italy, C:P13
15. А.В. Киракосян, Х.Т. Назаретян, С.В. Айдинян, ФОРМИРОВАНИЕ FeNiAlCo И FeNiAlCoCr ВЫСОКОЭНТРОПИЙНЫХ СПЛАВОВ ПРИ ВЫСОКИХ СКОРОСТЯХ НАГРЕВА, Российско-армянский научный семинар “Химия в Армении”, 24-28 октября 2022, Ереван, Армения.
16. H. Kirakosyan, Kh. Nazaretyan, N. Amirkhanyan, H. Beglaryan, S. Aydinyan, Silicon carbide whiskers by solution combustion synthesis with subsequent fast heating, Modern Materials and Manufacturing (MMM-2023), April 25–27, 2023, Tallinn, Estonia
17. S. Aydinyan, Kh. Nazaretyan, H. Kirakosyan, S. Kharatyan, Preparation of high-entropy refractory alloys by aluminothermic reduction process, Modern Materials and Manufacturing (MMM-2023), April 25–27, 2023, Tallinn, Estonia
18. Kh. Nazaretyan, H. Kirakosyan, S. Kharatyan, S. Aydinyan, The Preparation of High-Entropy Alloys by Combustion synthesis, New Trends in Chemistry Armenia, p. 242, September 24-28, 2023, Yerevan, Armenia
19. H. Kirakosyan, Kh. Nazaretyan, N. Amirkhanyan, H. Beglaryan, S. Aydinyan, SiC Based Composite Whiskers preparation by combining solution combustion synthesis and self-propagating high temperature synthesis, New Trends in Chemistry Armenia, p. 199, September 24-28, 2023, Yerevan, Armenia,

20. S. Aydinyan, H. Kirakosyan, Kh. Nazaretyan, Synthesis and characterization of high entropy MAX phases, New Trends in Chemistry Armenia, p. 44, September 24-28, 2023, Yerevan, Armenia

RESEARCH SKILLS

Synthesis and characterization of nanomaterials, combustion synthesis (CS) of biomaterials, metals and alloys and characterization by X-ray diffraction, scanning electron microscope, gas-chromatography, chemical analysis method. I have been worked with some physico-chemical methods for materials characterization, such as by X-ray diffraction, scanning electron microscope, chemical, adsorption, IR and Raman spectrophotometric analysis and thermal analysis methods.