Valerii Andreichev

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EDUCATION

Lomonosov Moscow State University, Department of Chemistry
Moscow, Russia
Master, **GPA: 4.97/5.0, TOEFL: 96** 27.06.23

RESEARCH EXPERIENCE

Moscow State University Department of Chemistry,
Undergraduate Researcher Moscow, Russia
Advisor: Dmitry Bugaenko, PhD Apr. 2021-Present

- Developed transition-metal-free C-S bond forming methodologies using diaryliodonium salts with *O*-alkyl xanthates.
- Applied these methodologies to obtain scope of different *S*-aryl xanthates.
- Used selected *S*-aryl xanthates to synthesize a number of organosulfur building blocks important for synthetic and medicinal chemistry.
- Developed methodologies to obtain (aryl)(alkyl)sulfide from *S*-aryl xanthates.
- Applied these methodologies to perform one-pot synthesis of various (aryl)(alkyl)sulfides using diaryliodonium salts and *S*-alkyl xanthates.
- Optimized transition-metal-free conditions for performing synthesis of aryl-substituted derivatives of diethyl acetamidomalonate.
- During work with C-nucleophiles we suggested and developed new type of diaryliodonium salts which have several advantages over previously known.
- Submitted work in *Organic Letters*; finished a second manuscript; third manuscript in preparation; presented work at two conferences.

Advisor: Dr. Olga Dorofeeva Oct. 2020-Present

- Performed precise quantum chemical calculations of thermodynamic functions and explored effect of pseudorotation for 2-methyltetrahydrofuran.
- Studied enthalpies of foundation of Polycyclic Aromatic Hydrocarbons (PAH).
- Used DLPNO-CCSD(T_1)/CBS method to produce benchmark-quality enthalpies of formation of PAHs in conjunction with isodesmic-type reactions.
- Created dataset for further improving group-additivity method for calculations of enthalpies of formation of PAHs.
- Published work in *Physical Chemistry Chemical Physics*; second paper published in *The Journal of Physical Chemistry A*.

Advisor: Ekaterina Bydinina, PhD Oct. 2019-Apr. 2021

- Researched applications of γ-azidobutyrates as building blocks for the synthesis of *N*-heterocycles.
- Studied enantioselective *aza*-Wittig reaction with phosphazenes and nitriles as a simple approach to a set of stereoisomers of tetrahyro-7-*aza*-indoles which considered as inhibitors of kinases, causing the apoptosis of cancer cells.

Advisor: Alexander Egorov, PhD Sep. 2017 - Jun. 2018

- Performed single stage synthesis of amorphous carbon covered nanotubes arrays nanosized films of high-purity iron on single crystal silicon substrate as a catalyst with a yield higher than that obtained by the CVD method on nickel catalyst.
- Studied catalytic activity of metal films with different thickness in a single experiment.
- Published work in *Carbon Trends*

TEACHING EXPERIENCE

Moscow State University Department of Chemistry Moscow, Russia

Teaching Assistant: Organic Chemistry (2021, 2022), Calculus (2019)

- Examined and reviewed tasks made by students.

University gymnasium of Moscow State University

Organic chemistry (2022, 2023), Organic Synthesis (2022, 2023)

- Taught students basic organic synthesis procedures and general concepts of organic chemistry.
- Performed synthesis of different organic compounds with students and taught them procedures of purification and identification of organic compounds.

TECHICAL SKILLS

Experimental: Chemistry: FTIR, 1D NMR, 2D NMR (COSY, NOESY), GC, HPLC, TLC, Column Chromatography, Flash Column Chromatography, HRMS, Extraction, Schlenck lines, Polarimetry, Reducing Atmosphere, Vacuum distillation, Fluorescence Spectroscopy, Spectrophotometry, Transmission Electron Microscopy.

Biology: Bacterial Cloning, PCR, Real-Time PCR, Miniprep, Gel electrophoresis, Protein Purification, Bacterial Cell Culture, Transformation, Atomic Force Microscopy.

Computational: Microsoft Office, ChemDraw, Avogadro, Chemcraft ORCA, Gaussian, xtb-software, Crest, PyMOL, Schrodinger software, MNova, ACD/Labs software, Python, R

PUBLICATIONS

- Dmitry I. Bugaenko, Alexey A. Volkov, **Valeriy V. Andreychev**, and Alexander V. Karchava. Reaction of Diaryliodonium Salts with Potassium Alkyl Xanthates: A Versatile Entry Point to Accessing Organosulfur Compounds. *Organic Letters,* 2023
- Olga V. Dorofeeva and **Valeriy V. Andreychev**. Benchmark Thermochemistry of Polycyclic Aromatic Hydrocarbons. *J. Phys. Chem. A,* 2022.
- Ilin Dmitriy Yu., Tarazanov Sergey V., **Andreychev Valeriy V**., Lukyanova Vera A., Druzhinina Anna I., Pimenova Svetlana M., Dorofeeva Olga V. Low-temperature heat capacity and pseudorotation in 2-methyltetrahydrofuran. *Phys. Chem. Chem. Phys., 2022, **24**, 5437-5447.*
- Egorov Alexander V., **Andreychev Valeriy V.,** et al. Single stage synthesis of amorphous carbon covered nanotubes arrays. *Carbon Trends* Volume 5, October 2021.

CONFERENCE PRESENTATIONS

- **Valeriy V. Andreychev**, Alexey A. Volkov, Dmitry I. Bugaenko. Novel reactions of diaryliodonium salts with C– and S– nucleophiles. International scientific conference of students, graduate students and young scientists "*Lomonosov-2023*", section "*Chemistry*", 2023, Moscow.
- **Valeriy V. Andreychev**, Alexey A. Volkov, Dmitry I. Bugaenko and Alexander V. Karchava. New approach for creating C-S bond using diaryliodonium salts. *Modern problems of organic chemistry*, 2022, Novosibirsk.

- **Valeriy V. Andreychev**, Alexey A. Volkov, Dmitry I. Bugaenko. New approach for creating C-S bond using diaryliodonium salts. International scientific conference of students, graduate students and young scientists "*Lomonosov-2022*", section "*Chemistry*", 2022, Moscow.