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Загребаев Александр Дмитриевич
Исследовательская лаборатории "Микрофлюидные технологии для ускоренного синтеза материалов"

Должность: Инженер
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Дата рождения: 13.09.1995 г.,г.Ростов-на-Дону, Россия

Образование:
г.?: (04.05.01 Фундаментальная и прикладная химия).
г.?: аспирант (04.06.01 Химические науки)
2022 г.: кандидат химических наук по специальности 1.4.3. Органическая химия.

Направления исследований (ключевые слова): микрофлюидика, металл-органические каркасные системы (МОКП), катализ, карго-системы, биохимия, докинг, квантовая химия, биологическая активность, таргетная терапия.

Область научных интересов:

- разработка и использовании методов микрофлюидики и технологий "лаборатории на чипе" для синтеза различных органических молекул и сложных молекулярных комплексов.
- металл-органические каркасные системы типа CPO-27, FA и UiO-66.
- применение методов микрофлюидики для синтеза разнообразных соединений.

Методы:

- синтетические:микрофлюидный, гидротермальный и микроволновый.
- постсинтетические: препаративная жидкостная хроматография, UV-vis спектрофотометрия, XRD, NMR;
- теоретические: qsar, докинг моделирование, ab initio расчеты.

Научные публикации в реферируемых журналах:

1. Burov O. N., Kurbatov S. V., Kletskii M. E., Zagrebaev A. D., Mikhailov I. E. Synthesis and structure of dihydroberberine nitroaryl derivatives – potential ligands for G-quadruplexes // Chemistry of Heterocyclic Compounds. – 2017. – Т. 53, № 3. – С. 335-340.

2. Vikrishchuk N. I., Popov L. D., Borodkin G. S., Dranikova A. Y., Kletskii M. E., Zagrebaev A. D., Burov O. N. New Acylhydrazones of Indole Series and Their Metal Complexes // Russian Journal of General Chemistry. – 2018. – Т. 88, № 5. – С. 962-967.
3. Demekhin O. D., Zagrebaev A. D., Burov O. N., Kletskii M. E., Pavlovich N. y. V., Bereznyak E. A., Tsimbalistova M. V., Kurbatov S. V. The first 13-vinyl derivatives of berberine: synthesis and antimicrobial activity // Chemistry of Heterocyclic Compounds. – 2019. – Т. 55, № 11. – С. 1128-1130.
4. Plyaka P., Demekhin O., Svetlichnyy D., Zagrebaev A., Budnik A. A fluorescent dissolved oxygen sensor with autocalibration based on ruthenium (II) tris-bathophenanthroline complex // Journal of Physics: Conference Series. – 2021. – Т. 2131, № 5. – С. 052094.
5. Zagrebaev A. D., Burov O. N., Kletskii M. E., Kurbatov S. V. A Reaction of Berberine with Amides in Alkaline Media: An Experimental and Quantum-Chemical Study // Chemistry of Heterocyclic Compounds. – 2022. – Т. 58, № 6-7. – С. 363-367.
6. Zagrebaev A. D., Burov O. N., Kletskii M. E., Lisovin A. V., Kurbatov S. V., Demekhin O. D. The Synthesis and Investigation of New Electroneutral Berberine Derivatives // Chemistry of Heterocyclic Compounds. – 2022. – Т. 58, № 1. – С. 45-57.
7. Попов А. А., Дряпак А. Н., Буров О. Н., Клецкий М. Е., Ткачук А. В., Алешукина А. В., Голошва Е. В., Маркова К. Г., Березинская И. С., Твердохлебова Т. И. AN AZO COUPLING OF BERBERINE DERIVATIVES: AN EXPERIMENTAL AND QUANTUM-CHEMICAL STUDY // Chemistry of Heterocyclic Compounds. – 2023. – Т. 59, № 8. – С. 604-609.

Российские гранты:

- «Синтез и исследование новых электронейтральных цвиттер-ионных производных берберина» Конкурс на лучшие проекты фундаментальных научных исследований, выполняемые молодыми учеными, обучающимися в аспирантуре («Аспиранты»), РФФИ научный проект № 20-33-90262.
- Конкурс на получение доступа к электронным научным информационным ресурсам зарубежных издательств 2012 года РФФИ научный проект № 12-00-14219 Ир.
- Программа развития университета на 2021–2030 годы в рамках реализации программы стратегического академического лидерства «Приоритет-2030» от Федерального государственного автономного образовательного учреждения высшего образования «Южный федеральный университет».

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September 13, 1995

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Academic positions : Engineer

Education and Degrees:
During my academic career, I pursued a degree in Fundamental and Applied Chemistry (04.05.01) as an undergraduate and later continued my studies in the field of Chemistry (04.06.01) as a graduate student at the Chemical Faculty of Southern Federal University (SFU). My primary research focus involved the development of novel biologically active compounds with targeted biological activity and the investigation of structural features influencing their final activity. In 2022, I successfully defended my dissertation in the Department of Organic Chemistry, under the Dissertation Committee 24.2.398.05 at North Caucasus Federal University in Stavropol, specializing in 1.4.3. Organic Chemistry (Chemical Sciences).

Research sectors (Keywords):
Microfluidics, metal-organic framework systems (MOFs), catalysis, cargo systems, biochemistry, docking, quantum chemistry, biological activity, targeted therapy.

Fields of interest:

- Currently, my research interests are primarily focused on the development and application of microfluidics and "lab-on-a-chip" technologies for synthesizing various organic molecules and complex molecular complexes.
- The main objects of my research include metal-organic framework systems such as CPO-27, FA, and UiO-66. These materials are of interest for gas separation and catalyzing chemical reactions, and they hold promise for delivering pharmaceutical compounds within the human body, particularly in pre-cancerous regions. This effect

is not limited to metal-organic framework systems alone but is a common property of nanoparticles. However, MOFs, thanks to their high porosity, can transport a significantly larger amount of active substances.

- The use of microfluidics methods represents a potentially promising approach for synthesizing a variety of compounds. It is well known that laboratory-scale synthesis significantly differs from methods used in industrial production. Microfluidics offers an intriguing alternative to microreactors. Micro- and nanotubes efficiently model chemical reactions that occur in small laboratory flasks and, in some cases, even surpass them in efficiency. Automation and continuity in the process help reduce the influence of human factors, which often play a significant role in synthesis and result processing.

Methods:

- Synthetic synthesis methods include microfluidic, hydrothermal, and microwave methods.
- Post-synthetic methods include preparative liquid chromatography, UV-visible spectrophotometry, X-ray diffraction (XRD), and nuclear magnetic resonance spectroscopy (NMR).
- Theoretical methods encompass quantitative structure-activity relationship (QSAR), docking modeling, and ab initio calculations.

Monographs, book chapters, papers, etc.:

1. Burov O. N., Kurbatov S. V., Kletskii M. E., Zagrebaev A. D., Mikhailov I. E. Synthesis and structure of dihydroberberine nitroaryl derivatives – potential ligands for G-quadruplexes // Chemistry of Heterocyclic Compounds. – 2017. – Vol. 53, No. 3. – pp. 335-340.
2. Vikrishchuk N. I., Popov L. D., Borodkin G. S., Dranikova A. Y., Kletskii M. E., Zagrebaev A. D., Burov O. N. New Acylhydrazones of Indole Series and Their Metal Complexes // Russian Journal of General Chemistry. – 2018. – Vol. 88, No. 5. – pp. 962-967.
3. Demekhin O. D., Zagrebaev A. D., Burov O. N., Kletskii M. E., Pavlovich N. Y. V., Bereznyak E. A., Tsimbalistova M. V., Kurbatov S. V. The first 13-vinyl derivatives of berberine: synthesis and antimicrobial activity // Chemistry of Heterocyclic Compounds. – 2019. – Vol. 55, No. 11. – pp. 1128-1130.
4. Plyaka P., Demekhin O., Svetlichnyy D., Zagrebaev A., Budnik A. A fluorescent dissolved oxygen sensor with autocalibration based on ruthenium (II) tris-bathophenanthroline complex // Journal of Physics: Conference Series. – 2021. – Vol. 2131, No. 5. – p. 052094.
5. Zagrebaev A. D., Burov O. N., Kletskii M. E., Kurbatov S. V. A Reaction of Berberine with Amides in Alkaline Media: An Experimental and Quantum-Chemical Study // Chemistry of Heterocyclic Compounds. – 2022. – Vol. 58, No. 6-7. – pp. 363-367.
6. Zagrebaev A. D., Burov O. N., Kletskii M. E., Lisovin A. V., Kurbatov S. V., Demekhin O. D. The Synthesis and Investigation of New Electroneutral Berberine Derivatives // Chemistry of Heterocyclic Compounds. – 2022. – Vol. 58, No. 1. – pp. 45-57.
7. Popov A. A., Dryapak A. N., Burov O. N., Kletskii M. E., Tkachuk A. V., Aleshukina A. V., Goloshva E. V., Markova K. G., Berezinskaya I. S., Tverdokhlebova T. I. AN

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Russian national grants:

Role of the performer in grants:

- "Synthesis and study of new electron-neutral quaternary ammonium derivatives of berberine" Competition for the best projects of fundamental scientific research carried out by young scientists enrolled in graduate school ("Aspirants"), RFBR scientific project No. 20-33-90262.
- RFBR scientific project No. 12-00-14219 Ir "Competition for access to electronic scientific information resources of foreign publishers in 2012."
- University development program for 2021–2030 as part of the implementation of the "Priority-2030" strategic academic leadership program from the Federal State Autonomous Educational Institution of Higher Education "Southern Federal University."