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Булгаков Алексей Николаевич
Исследовательская лаборатории "Микрофлюидные технологии для ускоренного синтеза материалов"

Должность: Инженер-исследователь
Email: albu@sfedu.ru

Дата рождения: 26.02.1999 г.,
Ростов-на-Дону, Россия

Образование и ученые степени:
2020 г.: высшее, бакалавриат, Южный Федеральный Университет, Физический факультет,03.03.02 Физика .
2022 г.: высшее, магистратура, Международный исследовательский институт интеллектуальных материалов, 03.04.02 Физика, Nanoscale Structure of Materials (Наноразмерная структура материалов).

Направления исследований:
Оптимизация каталитических реакций, in situ диагностика материалов, катализ с использованием микрофлюидных установо**к.**

Область научных интересов:
Оптимизация условий протекания каталитических реакций. Рациональный подход к подбору оптимальных условий в современной химической промышленности, глубокое понимание строения активных центров катализаторов и их поведения в ходе каталитических реакций, разработка диагностики с использованием методов машинного обучения для новых промышленно значимых катализаторов на основе платины и палладия.

Российские гранты :
ФНТП_СиН ,ФЦНТП Италия;
Приоритет-2030 (действующий исполнитель).

Научные публикации в реферируемых журналах:

1. 3D-printed microfluidic system for the in situ diagnostics and screening of nanoparticles synthesis parameters. DOI: 10.1016/j.mne.2023.100224.
2. Effect of the Hydride and Carbide Phases of Palladium Nanoparticles on the Vibration Frequencies of Adsorbed Surface Molecules. DOI: 10.1134/S0023158423020088.
3. Solvothermal synthesis of rhombic shape GdF3:Tb3+ nanoparticles for biomedical applications. DOI: 10.37748/2686-9039-2023-4-2-4.
4. Carbon Monoxide Oxidation on the Surface of Palladium Nanoparticles Optimized by Reinforcement Learning. DOI: 10.1134/S1027451023020088.
5. Operando Laboratory X-ray Absorption Spectroscopy and UV–Vis Study of Pt/TiO2 Photocatalysts during Photodeposition and Hydrogen Evolution Reactions. DOI: 10.3390/catal13020414.
6. Rational Functionalization of UiO-66 with Pd Nanoparticles: Synthesis and In Situ Fourier-Transform Infrared Monitoring. DOI: 10.1021/acs.inorgchem.1c03340.
7. Synthesis and Description of Small Gold and Palladium Nanoparticles on CeO2 Substrate: FT- IR Spectroscopy Data. DOI: 10.1134/S1027451020030180.
8. Ultra-Small Pd Nanoparticles on Ceria as an Advanced Catalyst for CO Oxidation. DOI: 10.3390/catal9040385.

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Bulgakov Aleksei Nikolaevich

Born: Rostov-on-Don (Russia) 26.02.1999

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Academic positions: Research engineer

Education and Degrees:
Higher, Bachelor's degree
Name of the educational institution and its location:
Southern Federal University, Bolshaya Sadovaya str., 105, Rostov-on-Don, Rostov region, 344006 Faculty (structural subdivision): Faculty of Physics.
Year of admission "September 01", 2016, year of graduation "August 31", 2020.
Higher, Master's degree
Name of the educational institution and its location:
Southern Federal University, Bolshaya Sadovaya str., 105, Rostov-on-Don, Rostov region, 344006 Faculty (structural subdivision): International Research Institute of Intelligent Materials.
Year of admission "September 01", 2020, year of graduation "August 31", 2022
Specialty/training direction (by diploma):
Bachelor's degree: 03.03.02 Physics
Master's Degree: 03.04.02 Physics
Direction/specialization (by diploma):
Master's degree: Nanoscale Structure of Materials (Nanoscale Structure of Materials)

Research sectors :
Optimization of catalytic reactions, in situ materials diagnostics, catalysis using microfluidic setups.

Fields of interest:

I work on optimization of conditions for catalytic reactions. A rational approach to the selection of optimal conditions plays an important role in the modern chemical industry. This requires a deep understanding of the structure of active centers of catalysts and their behavior during catalytic reactions. My work focuses on the development of diagnostics using machine learning techniques for new industrially relevant platinum and palladium based catalysts.

Scientific publications in referred journals: 8 articles

- 3D-printed microfluidic system for the in situ diagnostics and screening of nanoparticles synthesis parameters. DOI: 10.1016/j.mne.2023.100224
- Effect of the Hydride and Carbide Phases of Palladium Nanoparticles on the Vibration Frequencies of Adsorbed Surface Molecules. DOI: 10.1134/S0023158423020088
- Solvothermal synthesis of rhombic shape GdF3:Tb3+ nanoparticles for biomedical applications. DOI: 10.37748/2686-9039-2023-4-2-4
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Russian national grants:
Priority-2030 (current project).