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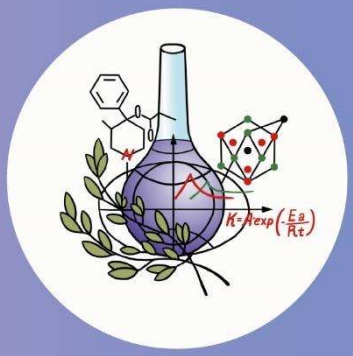
The Seventh International Scientific Conference:

# Advances in Synthesis and Complexing




**Moscow, RUDN University**
**September 29 - October 03, 2025**

# BOOK OF ABSTRACTS

Organic Chemistry / Medicinal and Pharmaceutical Chemistry
Inorganic and Coordination Chemistry / Physical and Colloidal Chemistry

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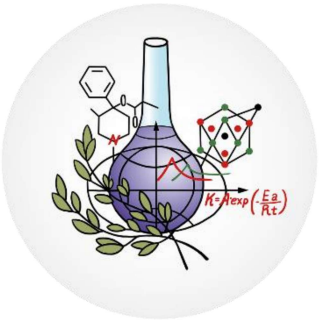

# ADVANCES IN SYNTHESIS AND COMPLEXING

## Book of abstracts
## The seventh International Scientific Conference

***Organic Chemistry***
***Medicinal and Pharmaceutical Chemistry***
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**2025**

**Успехи синтеза и комплексообразования = Advances in synthesis and complexing:** сборник тезисов седьмой Международной научной конференции. Москва, РУДН, 29 сентября – 3 октября 2025 г. – Москва : РУДН, 2025. – 316 с. : ил.

The book of abstracts of the Seventh International Scientific Conference: «Advances in Synthesis and Complexing» which was held from 29 September to 3 October 2025 based on chemical departments of Faculty of Science of RUDN University includes abstracts of lectures of plenary, key-note and invited speakers, oral reports and poster session.

The present publication was designed to popularize scientific research activity in the field of chemistry and to discuss modern chemical problems on the international level. The digest is intended for scientists, students, postgraduates and for wide range of readers interested in problems in chemistry.

# Visible light hydrosilylation photocatalysis with $Pd^{II}$ and $Pt^{II}$ N-heterocyclic carbene complexes

**Kashina M.V., Kinzhalov M.A.**

*St. Petersburg State University,*
*199034, Saint Petersburg, Universitetskaya Emb. 7–9*
*e-mail: m.kashina@spbu.ru*

Transition metal photocatalysts enable conventional catalytic transformations such as cross-coupling and C–H functionalization with comparable atom economy under significantly milder conditions, thereby enhancing chemoselectivity crucial for pharmaceutical and polymer synthesis. N-heterocyclic diaminocarbenes (NHCs) are attractive ligands for photocatalytic design due to their strong donor character and structural diversity accessible via reactions of N-nucleophiles with platinum-group isocyanide complexes [1].

We prepared a series of new $Pt^{II}$- and $Pd^{II}$-NHC complexes *via* the coupling of α-aminoazaheterocycles **7–10** and metal-bound isocyanides *cis*-[$MCl_2(CNR)_2$] (**1–4**, M = Pd, Pt) (**Fig. 1**), affording binuclear products **12–23** in good isolated yields (84–95%) [2, 3]. TD-DFT analysis revealed that their absorption profiles are governed by the azaheterocyclic fragment, with bands assigned to $^1$L'LCT/$^1$ILCT or $^1$L'LCT/$^1$LMCT (**21**, **23**) transitions. Under blue irradiation ($\lambda_{max}$ = 450 nm) all Pt-NHCs species catalyze the reaction of diphenylacetylene and $Et_3SiH$ for 6–12 h. with a 0.1 mol% catalyst loading. The highest catalytic efficiency was achieved with complex **17** (R = Mes, X = CH, 98%), indicating the effect of R substituent and azaheterocycle on the catalytic process. With green-light ($\lambda_{max}$ = 500 nm) red derivatives **21** and **2 3** led to 97–99% yield of (diphenylvinyl)triethylsilane. This work thus demonstrates the first photocatalytic system for alkyne hydrosilylation based on Pt-NHC complexes that operates efficiently under mild green-light conditions. Guided by these results, we targeted related binuclear complexes via a multicomponent approach from more accessible reagents.

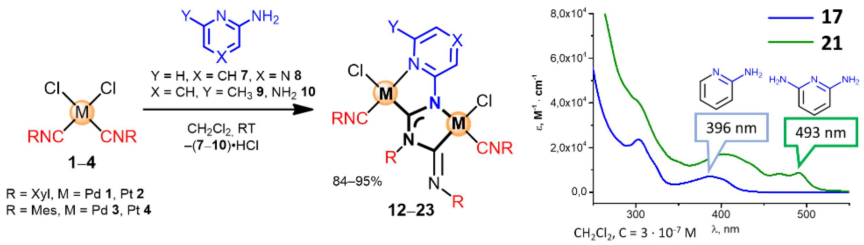


**Fig. 1.** Synthesis of binuclear M-NHC complexes (left) and absorption spectra of **17** and **21** (right).

*This work was supported by the Russian Science Foundation (project №25-23-00345). Measurements were performed in the Research Park at St. Petersburg State University (the resource centres CMR, CXDS, CCAMR, CLMR, DCE and CC).*

**References**

[1] Luzyanin K. V., Kinzhalov M. A. Synthesis and Applications in Chemistry and Materials: Volume 13: Metal Complex Catalytic Systems and Materials. **2024**. 3–44.
[2] Kashina, M. V., Luzyanin, K. V., Katlenok, E. A., Novikov, A. S., Kinzhalov, M. A. Dalton Trans., **2022**, 51, 6718.
[3] Kashina, M. V., Luzyanin, K. V., Katlenok, E. A., Kinzhalov, M. A. Chem. Eur. J., **2024**, 30, e202403264.