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XIII International Conference on Chemistry
for Young Scientists

BOOK OF ABSTRACTS



St Petersburg
University

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**XIII International Conference on Chemistry
for Young Scientists “MENDELEEV 2024”**

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2024

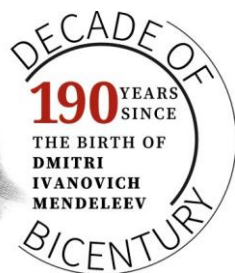
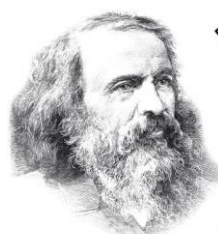
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OXIDATIVE ADDITION OF ALKYL HALIDES AND HALOGENS TO PLATINUM(II) ACYCLIC DIAMINOCARBENE COMPLEXES

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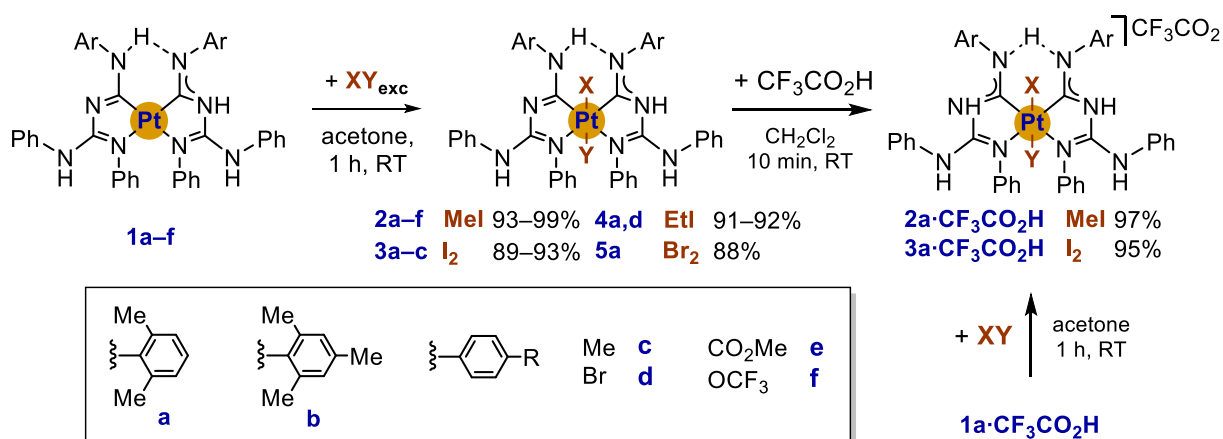
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Oxidative addition of small molecules (halogens and alkyl halides) to the metal center in organometallic complexes is a fundamental reaction in catalysis and new compounds design [1]. Deprotonated acyclic diaminocarbene (ADC) d^8 platinum(II) complexes can easily attach new ligands to the apical positions. In addition, such complexes can be easily obtained by combining isocyanide complexes with N,N-diphenylguanidine [2]. Furthermore, a series of deprotonated platinum(II)-ADC complexes with good antitumor activity against triple-negative breast cancer cells was obtained in our research group [3].

In the present work, the oxidative addition of MeI, EtI, Br₂ and I₂ has been investigated, as platinum(IV) ADC-complexes have never been synthesized by the oxidative addition (**Scheme 1**). Furthermore, the protonation experiments have been carried out to symmetrize the structures and to explore the carbene atoms ¹³C chemical shifts, as in the deprotonated forms it was hard to determine which signal was carbene due to overlapping. The oxidative addition was found to shift the ¹³C carbene signals 20–30 ppm to the lower field compared to the original platinum(II)-ADC. All compounds were isolated as fine solids and characterized by means of physicochemical analysis.



Scheme 1. The oxidative addition reactions.

References

- [1] *Coord. Chem. Rev.* **2014**, 279, 115
 [2] *Russ. J. Inorg. Chem.* **2022**, 67, 48
 [3] *Chem Eur. J.* **2024**, e202400101

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