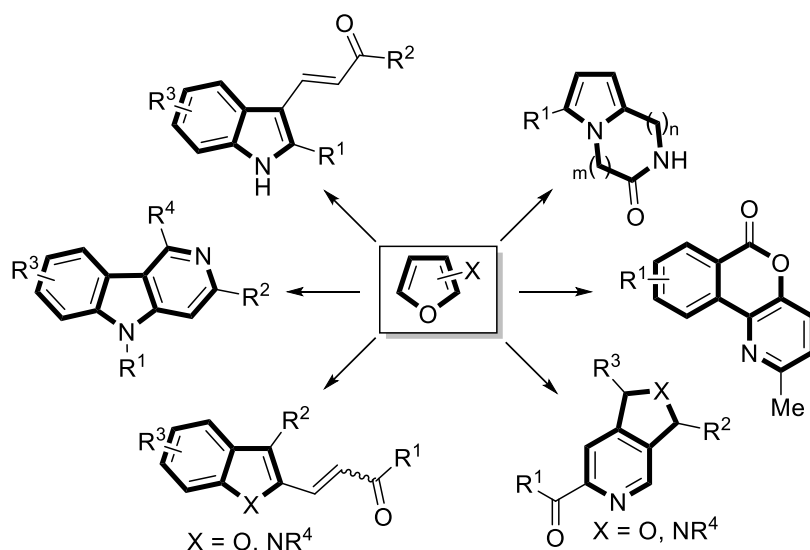


DEAROMATIZATION OF FURANS IN THE SYNTHESIS OF HETEROCYCLES

Keywords: furan, dearomatization, heterocycles.

Due to low energy of aromaticity, furan substrates may undergo chemical transformations that are unusual to those of arenes or other heterocycles. In such transformations furan nucleus may serve as masked 1,3 diene, enol ether or 1,4-dicarbonyl compound. This unique reactivity allows furans to be utilized in synthesis of a large variety of useful products, from alkanes to prostaglandines. Nitrogen-containing heterocycles are considered as ones of the most important among organic molecules, thus this is highly attractive to develop new synthetic routes toward such heterocyclic systems based on the utilization of so-called “furan platform”. That would provide an inexpensive way toward valuable objects exploiting products of biomass processing.

During the last decade we have developed general synthetic approaches toward functionalized heterocycles based on the furan rearrangement strategy [1–7]. Recent results, discussion on mechanisms of specific transformations along with the scope and limitations of furan rearrangements into diverse polysubstituted heterocycles will be given.



References

1. Zelina E. Y., Nevolina T. A., Skvortsov D. A. et al. // *J. Org. Chem.* 2019. Vol. 84. P. 13707.
2. Makarov A. S., Uchuskin M. G., Hashmi A. S. K. // *Chem. Sci.* 2019. Vol. 10. P. 8583.
3. Makarov A. S., Kekhvaeva A. E., Chalikidi P. N. et al. // *Synthesis.* 2019. Vol. 51. P. 3747.
4. Zelina E. Y., Nevolina T. A., Sorotskaja L. N. et al. // *J. Org. Chem.* 2018. Vol. 83. P. 11747.
5. Shpuntov P. M., Kolodina A. A., Uchuskin M. G. et al. // *Eur. J. Org. Chem.* 2018. P. 461–469.
6. Makarov A. S., Uchuskin M. G., Gevorgyan V. // *J. Org. Chem.* 2018. Vol. 83. P. 14010.
7. Makarov A. S., Merkushev A. A., Uchuskin M. G. et al. // *Org. Lett.* 2016. Vol. 18. P. 2192.

** This work was supported by the Russian Foundation for Basic Research (grant № 19-43-590007 p_a) and Russian Science Foundation (grant № 19-73-00093).*

УДК 547.38

**M. S. Yusubov, A. Yoshimura,
V. V. Zhdankin**

*Tomsk Polytechnic University,
634050, Russia, Tomsk, Lenin Ave., 30,
yusubov@tpu.ru*

IODONIUM SALTS IN ORGANIC SYNTHESIS*

Keywords: hypervalent iodine, diaryliodonium, nucleophilic fluorination, PET, fluorine-18.

Hypervalent iodine compounds have found wide practical application as versatile, efficient, and sustainable reagents for organic synthesis. The preparation and reactions of diaryliodonium, alkenyl(aryl)iodonium, alkynyl(aryl)iodonium, and alkyl(aryl)iodonium salts are overviewed. Application of these reagents allows mild and highly selective arylations, alkenylations, alkynylations, and alkylations of various organic and inorganic substrates in a facile and environmentally friendly manner. The lecture also summarizes the chemistry of iodonium ylides with emphasis on their synthetic applications. Iodonium ylides have found synthetic application as efficient carbene precursors, especially useful as reagents for cyclopropanation of alkenes and preparation of heterocyclic compounds. Recently iodonium ylides have been utilized as efficient reagents in the thiotrifluoromethylation and nucleophilic fluorination reactions.

Also summarizes the applications of iodonium compounds in the rapidly developing field of Positron Emission Tomography (PET). Reactions of