

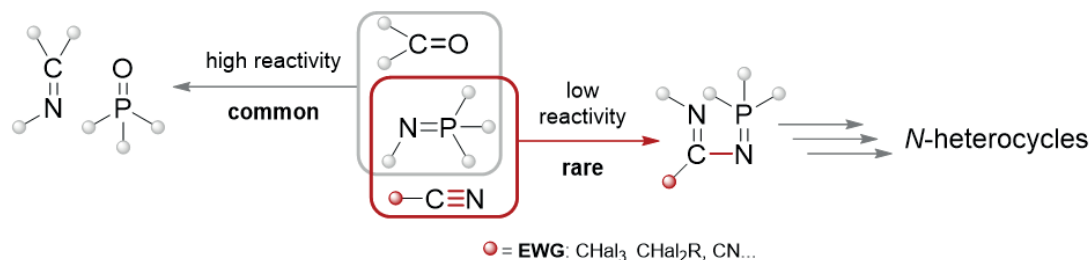
α -EWG-CONTROLLED AZA-WITTIG REACTION WITH NITRILES

Hamidulla B. Tukhtaev,^{1,2} Konstantin L. Ivanov,¹ Ekaterina M. Budynina¹

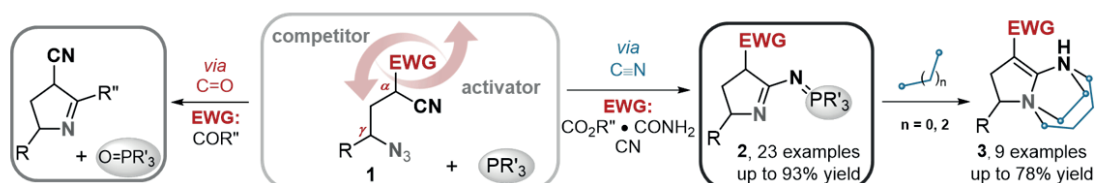
¹ Department of Chemistry, Lomonosov Moscow State University, Leninskie gory 1-3, Moscow 119991 Russia

² Institute of Bioorganic Chemistry Uzbek Academy of Sciences, Mirzo Ulugbek str. 83, Tashkent 100125 Uzbekistan
chem.hamidullo@gmail.com

The *aza*-Wittig reaction is a well-known rapid access to C=N bond formation. This process provides numerous opportunities for the synthesis of N-containing organic molecules. [1]. Among various *aza*-Wittig reactions, the interactions between *aza*-Wittig reagents, phosphazenes, and compounds containing polar double bonds (primarily in the carbonyl group) are the most studied. Oppositely, reactions involving the triple C \equiv X bonds of acetylenes or nitriles are described scarcely. However, this challenging type of *aza*-Wittig reactions could allow for installing an additional nitrogen atom in the assembled molecules and, thus, synthesizing various heterocyclic systems with at least two nitrogen atoms.



Here, we report an *aza*-Wittig reaction wherein the efficient control of the competition between the C \equiv N and C=O groups provides for chemoselective assembly of N-heterocycles. α -EWGs were found to control chemoselectivity and, depending on their nature, act as CN group activators (e.g., ester, amide or nitrile) or competitors (e.g., ketone) in *aza*-Wittig reactions. To demonstrate the synthetic utility of the obtained iminophosphazenes **2** as *N,N*-binucleophiles, their transformations into pyrrole-fused systems **3**, pyrrolo[1,2-*a*]imidazoles and pyrrolo[1,2-*a*][1,3]diazepines, were carried out [2].



This research was supported by the Russian Foundation for Basic Research (grant 18-53-41009) and Ministry of Innovation Development of the Republic of Uzbekistan (grant MRU-FA-74/2017).

References:

- Palacios, F.; Alonso, C.; Aparicio, D.; Rubiales, G.; Santos, J. M. *Tetrahedron* 2007, 63, 523.
- Tukhtaev, H. B.; Ivanov, K. L.; Bezzubov, S. I.; Cheshkov, D. A.; Melnikov M. Ya.; Budynina, E. M. *Org. Lett.* 2019, 21, 1087.