**TERT-BUTYLNITRITE IN THE SYNTHESIS OF FUNCTIONALIZED ISOXAZOLE DERIVATIVES**

*Astakhova N.E., Vasilenko D.A., Averina E.B.*

Moscow State University, Chemistry department, Moscow, Russia

[*nadezhda.astakhova@chemistry.msu.ru*](mailto:nadezhda.astakhova@chemistry.msu.ru)

Recently a preparative approach to 3-aryl-4-nitroisoxasoles has been elaborated in our laboratory. This process is based on the heterocyclization reaction of aryl substituted vinylketones **I** with t-BuONO in a mixture of dioxane and water [1]. In this work 5-methyl-4-nitroisoxazoles **II** were used for the functionalization of position 5 of the isoxazole moiety. For this purpose 5-methylisoxazoles **II** were involved in the condensation reaction with dimethylacetal N,N-dimethylformamide to obtain a series of 4-nitro-5-enamines **III.** It is known that enamines **III** are characterized by a variety of synthetic applications because they can react with electrophilic and radical agents [2]. We found that the reaction of enamines **III** with t-BuONO in the presence of BF3∙OEt2 proceeds with the formation of previously unknown 4-nitroisoxazol-5-carbonitriles **IV**. Using this general synthetic approach a large scope of substances **IV** was obtained in moderate to high yields.

**Scheme 1.** Synthetic approach to 4-nitroisoxazol-5-carbonitriles **IV**

4-Nitroisoxazol-5-carbonitriles **IV,** as a new structural type of isoxazol derivatives, are of interest to study their synthetic utilities. For carbonitriles **IV** two novel paths for modification were found with 4-nitroisoxazol-5-carbonitrile **Iva** as an example. The reduction of the nitro group at position 4 of isoxazole ring leads to 4-aminoisoxazol-5-carbonitrile **Va** in a good yield (60%), while SNAr reactions of cyano group at position 5 with N- and S-nucleophiles provide a range of isoxazole derivatives **VI** in 30-94% yields.



**Scheme 2.** Transformations of 4-nitroisoxazol-5-carbonitrile **IVa**

**References**

[1] Vasilenko D.A., Sadovnikov K.S., Sedenkova K.N., Kurova A.V., Grishin Y.K., Kuznetsova T.S., Rybakov V.B., Volkova Y.A., Averina E.B. *Synthesis*, 2020, V. 52, P. 1398.

[2] Dere R., Monasterolo C., Moccia M., Adamo M.F.A. Tetrahedron Lett. 2015, V. 56, P. 7168.