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# Nuclear-Chemical Method –New Opportunities for Synthesis of Unknown Biologically Active Diazinium Structures

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Nuclear-chemical method, based on tritium β-decay in hydrocarbons, gives chemists unique opportunity of carbocations generation. Nucleogenic phenyl cations (cations generated by β-decay) and their further ion-molecular reactions with different nucleophiles have been used previously by us for the preparation of unknown and hardly available biologically active monoazine derivatives [1-5]. 1,4-Diazines and condensed quinoxaline systems are known as an important type of heterocyclic derivatives with high biological activity, they exhibit a wide range of physiological activities including antibacterial, antimycobacterial, antiprotozoal and antitumor. Unfortunately, N-phenyl derivatives of 1,4-diazines haven't been obtained by any methods of classical chemistry yet. We have prolonged the nuclear-chemical method for the synthesis of several new N-phenylsubstituted diazinium derivatives by ion-molecular reactions of the nucleogenic phenyl cations obtained by tritium β-decay in double labeled benzene with unshared electron pair of nitrogen atom of heterocyclic compounds.
Carried out investigations revealed not existed in classic organic chemistry direct phenylation of nitrogen atom in 1,4-diazine substrates and one-step formation of unknown N-phenyl onium derivatives of pyrazine, quinoxaline and 2,3-dimethylquinoxaline.Synthesized compounds may be used as effective tritium labeled biological markers.

1. N.E. Shchepina, V.V. Avrorin, G.A. Alexandrova, G.A. Badun, I.I. Boiko, S.N. Shurov. Investigation of the phenylation of methyl-quinolines using tritium-labeled nucleogenic phenyl cations // Chemistry of Heterocyclic Compounds.2013. Vol. 49. No. 3 P. 428434.
2. Shchepina N.E., Avrorin V.V., Badun G.A., Lewis S.B., Shurov S.N. New way of direct nitrogen atom phenylation in quinoline derivatives //ISRN Organic Chemistry. 2012. V. 2012. P. 1-4.
3. N.E. Shchepina, V.V. Avrorin, G.A. Badun, I.I. Boiko. Preparation of N-phenylbenzo[h]quinolinium derivatives labeled with tritium // Chemistry of Heterocyclic Compounds, 2012. V. 48, No. 8. P. 1196-1199.
4. Shchepina N. E., Avrorin V. V., Badun G. A., Bumagin N. A., Lewis S. B., Shurov S. N. Pathways of ion-molecular interactions of nucleogenic phenyl cations with the nucleophilic centers of picolines //Organic and Medicinal Chemistry Letters. 2012. 2:14.
5. N.E. Shchepina, V.V. Avrorin, G.A. Badun, S.B. Lewis, S.E. Ukhanov. Preparation of fused N-phenyl-substituted pyridinium derivatives by direct phenylation with nucleogenic phenyl cations //Chemistry of Heterocyclic Compounds, 2012. V. 48, No. 8. P. 1196-1199.

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