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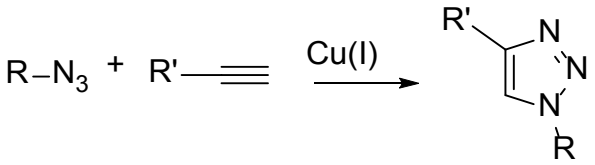
CLICK CHEMISTRY

Usually, the process of discovering new drugs based on natural secondary metabolites is very slow and expensive. Even with the appearance of combinatorial chemistry and high-throughput screening, the synthesis of substances depends on the reliability of individual reactions for constructing a new molecular framework. However, at the beginning of the 21st century, a new age of synthesis began, which was click chemistry.

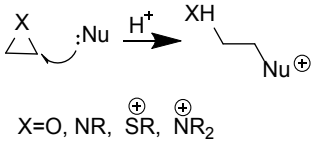
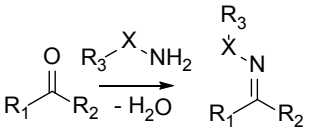
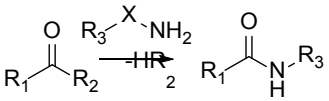
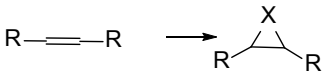
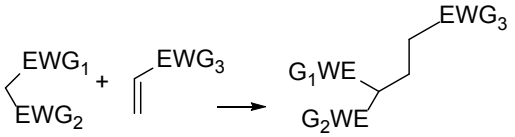
Click chemistry is a set of chemical reactions adapted to produce quickly and reliably a variety of chemicals by combining a few small elements. This is a concept that uses the most efficient and convenient methods in order to create new molecules that are eco-friendly, safe and highly effective. Each click-reaction is carried out with virtually no by-products. All or almost all atoms that were in the original molecules are included in the final molecule that we assemble. Therefore, there is no waste. Barry Sharpless was the first to invent this concept – "He was the founding father" [5]. Sharpless suggested using only the reagents that were easily accessible and insensitive to oxygen and water. The scientist developed several reactions that meet the requirements of this concept [4; 5]. *Using a Cu(I) salt catalyst makes*

the reaction mild and very efficient, does not require protective groups, as well as product purification in many cases.



Click chemistry includes a number of reactions that are easy to perform, do not require preliminary protection steps, run in high yields, and require either no or minimal purification of the products [3, 5].

Apart from the 1,3-dipolar cycloaddition reactions, described above, three more major classifications of click reactions have been identified nowadays:

Nucleopilic Ring-Openings	***Non-Adol Carbonyl Chemistry***	***Carbon Multiple Bond Additions***
 X=O, NR, $\overset{\oplus}{S}R$, $\overset{\oplus}{N}R_2$	*Hydrazone/oxime ether formation:*  *Amide/isourea formation:*  *X=O, NR*	*Formation of various three-member rings:*  X=O, NR, $\overset{\oplus}{S}R$, $\overset{\oplus}{N}R_2$ *Certain Michael additions:* 

Today click chemistry is a very relevant topic. Click chemistry methods are widely used all over the world. For example, in the field of biomedicine, these methods are applied to create new polymer hydrogels, 3D bioprinting of cell cultures, and synthesis of drugs using the principles of green chemistry. A state-of-the-art example is biocatalytic synthesis of islatravir – the possible medicine for HIV treatment [1, 2].

In Ukraine, synthetic chemists are actively working in this field. In Lviv, Kyiv, Kharkiv, Odesa, there are scientific schools that use click chemistry. Several

chemical companies, such as “Enamin”, use the concept of click chemistry to produce new compounds. Therefore, we should also expect a further increase in the use of these methods for the research of living systems and the development of new substances.

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ELECTROCHEMICAL DEPOSITION OF COBALT ON COPPER SURFACE FROM PERCHLORATE SOLUTION WITH ADDITION OF METHANOIC ACID

Cobalt is one of the transition metals widely used in various industrial sectors. It is a good construction material, and therefore, wear-resistant coatings based on it are of practical interest. One of the promising methods for obtaining materials with desired properties is electrochemical methods.

However, the kinetic features of cobalt electrodeposition are not well studied, which makes the topic of my research relevant.

The aim of the work was to study the peculiarities of the cobalt electroplating process from perchlorate electrolyte in the presence of methanoic acid on the copper surface.

The object of the study was an electrolyte with the addition of methanoic acid for the electroreduction of cobalt (II) cations and the cathode surface.