Etherification Reaction Of 4-(4-(R-Carboxymethyl)-1h-1,2,3-Triazol-1-Yl) Benzoic Acid with Monohydric Alcohols

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ABSTRACT

4-(4-(R-carboxymethyl)-1H-1,2,3-triazol-1-yl)benzoic acid, 4-(4-(hydroxymethyl)1H-1,2,3-triazol-1-yl) Synthesis based on mutual 1,3-dipolar cycloaddition in the presence of copper (I) iodide as a catalyst in the synthesis of benzoic acid derivatives. Carrying out an etherification reaction with ethyl alcohol to the synthesized 1,2,3-triazole derivative. The structure of the obtained substances and the use of modern physical research methods

Keywords: 4-(4-(R-carboxymethyl)-1H-1,2,3-triazol-1-yl)benzoic acid, 4-(4-(hydroxymethyl)1H-1,2,3-triazol-1-yl) benzoic acid, ethyl ether, ethyl alcohol, etherification reaction

Introduction

Currently, the synthesis of 1,2,3-triazole derivatives is a rapidly developing branch of organic chemistry, and various catalysts are used in the synthesis of 1,2,3-triazoles. 1,4-isomers of 1,2,3-triazoles are formed in the presence of copper (I) salts as a catalyst, and 1,5-isomers are formed in the presence of ruthenium catalyst.

During the synthesis of derivatives of triazoles, their various properties are studied [1-5]. The synthesis of complex esters of 1,2,3-triazoles is also important.

Many literature data show that organic compounds containing two carboxyl groups, as well as 1,2,3-triazole derivatives, create complex esters.

It can be observed from various scientific publications that the bond between the acetoxymethyl molecule connected to the carboxyl group is broken when the etherification reaction is carried out in the presence of acid or alkali as a catalyst in the etherification reaction, where one containing two carboxyl groups is combined with another group [6-8].

In the course of our scientific research, we carried out the synthesis of propargyl esters of saturated monobasic carboxylic acids. Then, we treated the propargyl esters of monobasic carboxylic acids with azidobenzoic acid in the presence of copper (I) halide salts in benzene environment [9-10].

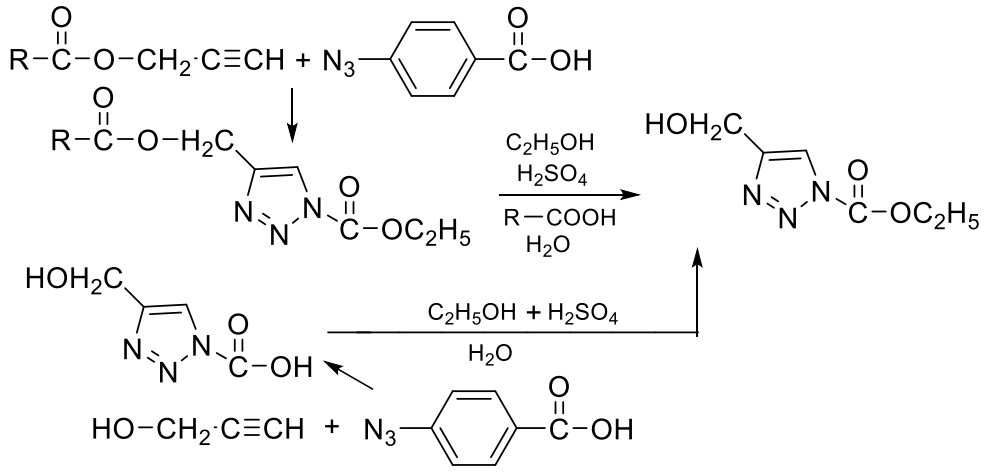
Then we synthesized several compounds from 4-(4-(R-carboxymethyl)-1H-1,2,3-triazol-1-yl)benzoic acid derivatives and studied some of their physical, chemical and biological properties. .

As a result, it was found that this synthesized substance is active not only chemically, but also biologically. After that, we continued the research. For a more complete study of the chemical properties of the obtained 1,2,3-triazole derivatives, 4-(4-(R-carboxymethyl)-1H-1,2,3-triazol-1-yl)benzoic acids with methyl and ethyl alcohol we carried out the etherification reaction under acidic conditions with

As a result of the reaction, with the formation of a new ether bond, the breaking of the existing complex ether bond was observed [10-13]. A similar situation was observed when this experiment was carried out in an alkaline environment. As a result of the reaction, we proved that methyl and ethyl ether of 4-(4-(hydroxymethyl) 1H-1,2,3-triazol-1-yl) benzoic acid was formed by ^{1}H NMR spectrum. The following method was used to obtain methyl and ethyl esters of 4-(4-(R-carboxymethyl)-1H-1,2,3-triazol-1-yl)benzoic acids.

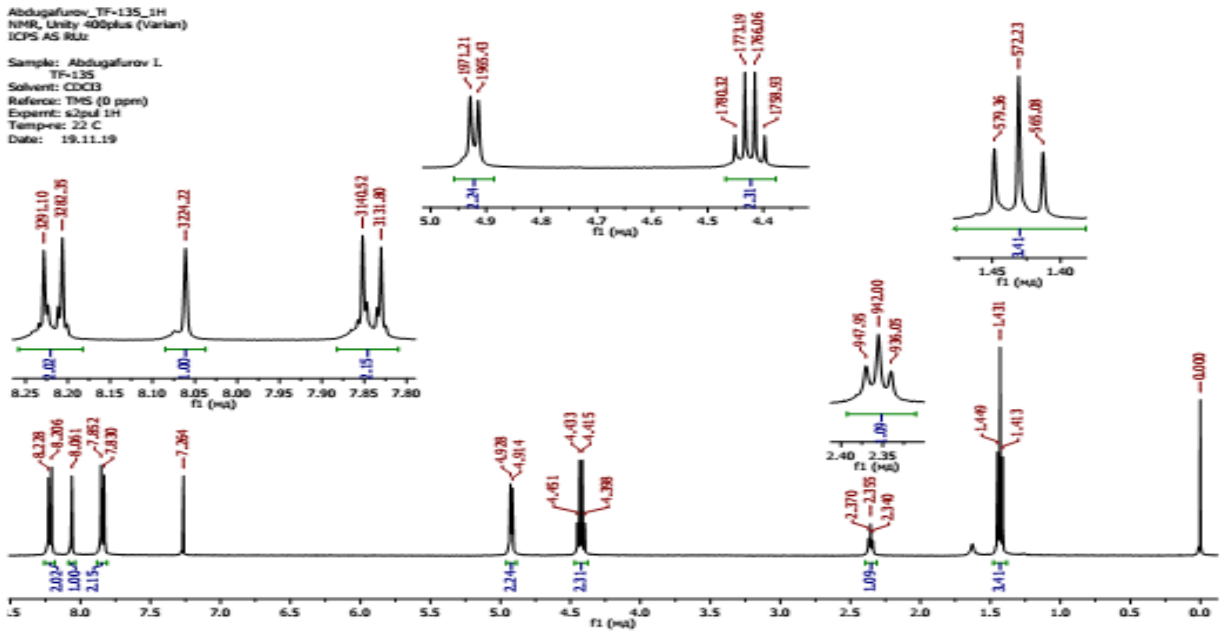
1.305 g of 4-(4-(acetoxymethyl)-1H-1,2,3-triazol-1-yl)benzoic acid was placed in a round-bottomed two-mouthed flask, and 20 ml of ethyl alcohol was poured over it. In the reaction, 2-3 drops of sulfuric acid were added as a catalyst. Then the solution was continued for 2-3 hours in a water bath and the white crystalline substance was filtered. The synthesized substance was initially examined by thin layer chromatography.

The results of modern physical and chemical tests of the substance synthesized in this experiment showed that the product 4-(4-(hydroxymethyl)1H-1,2,3-triazol-1 yl)benzoic acid ethyl ether was formed. After that, this reaction was carried out in an alternative way, that is, in the following way. The reaction equation is as follows.



^{1}H NMR spectrum of newly synthesized 4-(4-(hydroxymethyl)1H-1,2,3-triazol-1-yl)benzoic acid ethyl ether is shown. The chemical shift of protons in the ether is 1.42 m, to the protons of the signal methyl group (3H, t), 4.4 m, to the protons of the methylene group bound to the carboxyl group (2H, m), 7.84 m.u. protons of the benzene ring in the molecule belong to (2H, d, H-), 8.02 m.u. (2H, d,), in the spheres as a two-proton doublet, and the proton in the triazole ring (-C-H) as a one-proton singlet (1H, s) has a weak 8.06 m.u. it can be seen that it has a chemical shift in the field.

So, we can see that during the reaction, along with the etherification reaction, the existing complex ether bond is also broken. In this reaction, at the first stage, an etherification reaction takes place, then the above products are formed due to the hydrolysis process at the expense of the water formed in the reaction.



1- Picture. 4-(4-(Hydroxomethyl)-1H-1,2,3-triazol-1-yl) benzoic acid ethyl ether ether (^{1}H NMR spectrum)

Conclusion: When etherification reaction of 4-(4-(R-carboxymethyl)-1H-1,2,3-triazol-1-yl) benzoic acids with methyl and ethyl alcohols is carried out under acidic and alkaline conditions, a complex ether is simultaneously formed. as a result of hydrolysis of aceto-methyl bond, 4-(4-(hydroxymethyl) 1H-1,2,3triazol 1-yl) benzoic acid methyl and ethyl ether were formed.

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