

CHEMICAL ENGINEERING**CHANGE OF THE AMOUNT OF HYDOXYLNITROGEN CONTAIN COMPOUND BASED ON MONOETHANOLAMINE IN THE REACTION MEDIUM****Mirodil Janaev**

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Uzbekistan, TashkentE-mail: MGA1953@mail.ru**ИЗМЕНЕНИЕ КОЛИЧЕСТВА ГИДРОКСИЛАЗОТСОДЕРЖАЩЕГО СОЕДИНЕНИЯ
НА ОСНОВЕ МОНОЭТАНОЛАМИНА В РЕАКЦИОННОЙ СРЕДЕ****Жанаев Миродил Орифжон Угли**

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ABSTRACT

The reaction of aldehydes with amines, in particular amino alcohols, has been studied for a rather long time. The condensation of amino alcohols having a primary amino group with formaldehyde flows through the Schiff base and is characterized by the existence of tautomeric equilibrium [1]. In many cases, this equilibrium is shifted towards the cyclic product. It is noted that the interaction of monoethanolamine with formaldehyde leads to N, N', N'' - tris (β -hydroxyethyl) hexahydro-S-triazine or N, N-bisoxazolidine. The type of end product is determined by the reaction conditions and the molar ratio of amino alcohol: formaldehyde. The chromatogram of purified vacuum - distillation of the final product obtained at a molar ratio of monoethanolamine: formaldehyde = 1: 2 shows that this is an individual compound with a retention time of 4.173 s [2]. With an increase in the molar ratio of monoethanolamine: formaldehyde = 1: 2, the final product consists of only one product with a retention time of 4.187 s, which corresponds to methylene bisoxazolidine. A further increase in the molar ratio of monoethanolamine: formaldehyde to 1: 4 leads to the fact that the chromatogram of the final product distilled in vacuum contains a broad peak [3] with a retention time of 4.157 s and a gentle very wide peak with a retention time of 5.553 s. In this case, there are trace amounts of products that are apparently formed by side reactions involving formaldehyde, which is taken in large excess from stoichiometric.

АННОТАЦИЯ

Взаимодействие альдегидов с аминами, в частности аминспиртами, изучается достаточно давно. Конденсация аминспиртов, имеющих первичную аминогруппу, с формальдегидом протекает через основание Шиффа и характеризуется существованием таутомерного равновесия [1]. Во многих случаях это равновесие смещено в сторону циклического продукта. Отмечено, что взаимодействие моноэтаноламина с формальдегидом приводит к N, N', N'' - трис (β -гидроксиэтил) гексагидро-S-триазиину или N, N-бисоксазолидину. Тип конечного продукта определяется условиями реакции и молярным соотношением аминспирт: формальдегид. Хроматограмма очищенного вакуум-перегонки конечного продукта, полученного при молярном соотношении моноэтаноламин: формальдегид = 1: 2, показывает, что это индивидуальное соединение со временем удерживания 4,173 с [2]. При увеличении молярного соотношения моноэтаноламин: формальдегид = 1: 2 конечный продукт состоит только из одного продукта со временем удерживания 4,187 с, что соответствует метиленбисоксазолидину. Дальнейшее увеличение молярного соотношения моноэтаноламин: формальдегид до 1: 4 приводит к тому, что хроматограмма конечного продукта, перегоняемого в вакууме, содержит широкий пик [3] с временем удерживания 4,157 с и пологий очень широкий пик с время удерживания 5,553 с. В этом случае присутствуют следовые количества продуктов, которые, по-видимому, образуются в результате побочных реакций с участием формальдегида, который взят в большом избытке от стехиометрического.

Keywords: monoethanolamine, formaldehyde, hydroxy-nitrogen-containing compound, N, N', N'' - tris (β -hydroxyethyl) hexahydro-S-triazine.

Ключевые слова: моноэтаноламин, формальдегид, гидроксиазотсодержащее соединение, N, N', N'' - трис (β -гидроксиэтил) гексагидро-S-триазин.

Introduction: In recent years, the world's industry has been growing rapidly. The growth of the industry is due to various new developments and innovative projects. In particular, the attention paid to the chemical industry of our country has given another impetus to the development of the industry in our country. Extensive scientific and practical research proves that it is possible to produce some of the imported products and semi-finished products in our country [4]. Amino alcohols are heterofunctional compounds that exhibit chemical properties of both amines and alcohols. In this case, the mutual influence of functional groups leads to the manifestation of a number of features by them. In particular, due to the electron-withdrawing nature of hydroxyl groups [5], the basicity of amino alcohols and the nucleophilicity of the nitrogen atom of them are lower than in analogous aliphatic amines. In turn, the nucleophilicity of the oxygen atom of the hydroxyl group is also reduced due to the negative inductive effect of the amino group. The foregoing determines the moderate reactivity of the functional groups of amino alcohols in reactions characteristic of them, in particular, in nucleophilic addition reactions

Our studies were conducted on hydroxyl nitrogen-fixing (GAS) compounds. GAS compounds are widely

used in various industries. It is used in the purification of H₂S and various sour gases from oil and gas [6], in the production of polyurethane foam (KPU) [7] and in many other fields. Polyurethane foam (KPU) is used in many industries, including

Exsperimental part: It is widely used as the most effective insulating material in the construction of buildings and structures, in the production of sandwich panels, in household appliances. This, of course, gives it its own characteristics and convenience, depending on the area of application.

Monoethanolamine (MEA) and formaldehyde (FA) were synthesized in a 1: 1 mole ratio as the hydroxyl nitrogen preservative compound, and the azometin group preservative was obtained. Trimerization of the resulting substance produces N, N', N''-tris- (b-oxoethyl) -hyxohydro-S-triazine (TOEGT) [8]. When we analyzed the TOEGT, it was found that it contained a hydrosil group and a tertiary nitrogen, which could allow it to be used as a catalytic binding agent. As evidence, the alternative catalytic activity of the catalyst lapramol-294 in the production of PPU-307 foam polyurethane, which is widely used in various industries, has been studied [9].

The study lasted from three to ten minutes. The results show that NCO Group percentages have increased at different times. The higher the NCO group, the better the sewing of our product. The graph below shows that the results increase over time. Add 0.05 normal TOEGT and 0.05 normal TDI reaction mixture separately to each

vessel and mix in a thermostat at 40 °C for three to ten minutes, then pour them into a vessel containing 0.1 normal DEA reaction mixture. When we titrated with HCL, we obtained the following results.

Change of NCO group% concentration in the reaction mixture. Fig-1.

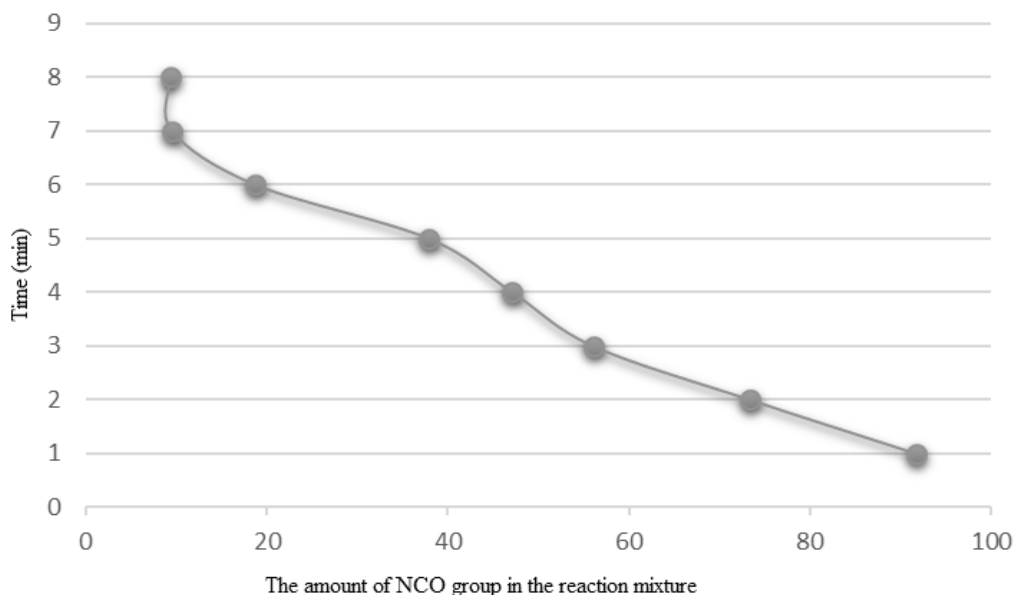


Figure 1. Change of NCO group% concentration in the reaction mixture

In our study, we studied the reaction between the NCO group of toluene diisocyanate (TDI) between the hydroxyl groups in TOEGT and the change in concentration per unit time at 40°C. This, of course, proved that

TOEGT, synthesized from local raw materials, is sufficiently effective when used in place of lapramol-294.

Thus, a systematic study was carried out to study the composition of the reaction mixture and the direction of the reaction of monoethanolamine with formaldehyde.

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