ISSN: 2350-0328
International Journal of Advanced Research in Science, Engineering and Technology
Vol. 6, Issue 11 , November 2019

Synthesis on the Basis of ACETYLENE 3-METHYLPENTAN-1-OL-3

Djurabaev Fozil Mamasolievich, Soliev Makhammadjon Ismatullaevich, Robiddinova Mukhlisa Sakhobiddin kizi, Zokirov Sodikjon

PhD candidate of faculty "Chemistry" at National University of Uzbekistan named after Mirzo Ulugbek, Uzbekistan.
PhD candidate of faculty "Chemistry" at National University of Uzbekistan named after Mirzo Ulugbek, Uzbekistan.
Postgraduate student at Namangan Engineering-Technology Institute
Associate Professor of department "Chemical Technology" at Namangan Engineering-Technological Institute, Uzbekistan.

ABSTRACT. This article describes the synthesis of 3-methylpentan-1-ol-3 in the presence of acetylene. Also, the optimal ratio of catalysts and solvents that enable the reaction to occur.

KEYWORDS: acetylene, potassium alkaline, 3-methylpentan-1-ol-3, diethyl ether.

I.INTRODUCTION

Recent research in the field of acetylene chemistry has made significant progress. As a result, new aspects of acetylene chemistry were discovered, various compounds of acetylene were synthesized, physical and chemical and operational properties were studied. Widespread use of acetylene compounds in the production of herbicides, fungicides, defoliants, drugs, metal corrosion inhibitors, extragents, plastics, synthetic rubber and dyes in various sectors of the national economy.

One of the most important products of acetylene compounds used in the national economy. The simultaneous presence of the acetylene bond and the hydroxyl group of C≡C in the molecule is the basis for the formation of more expensive new derivatives. Primary acetylene alcohol (propargil alcohol) and tertiary acetylene alcohol are relatively well studied. However, secondary α-acetylene alcohols are not well studied. Secondary acetylene alcohols can be synthesized based on the raw materials produced in Uzbekistan.

II. METHODS OF RESEARCH

Although the biological activity of acetylene alcohols (1) is very high, their synthesis processes have not been studied in detail. This is because this process, carried out by the Favorsky method (2), goes in different directions, depending on the circumstances. It can be summarized as follows:

$$C_3H_7CHO + HC \equiv CH \longrightarrow \begin{cases} C_3H_7CH(OH)-C \equiv CH & (I) \\ C_3H_7CH(OH)-C \equiv C-CH(OH)C_3H_7 & (II) \\ CH_3CH_2CH_2CH(OH)CH_2CH_2CH_2CHO & (III) \end{cases}$$

The study investigated the effects of temperature and catalyst on the synthesis of secondary acetylene alcohols under the following conditions:

In the experiments, was used as a solvent, potassium alkali as a catalyst, and aldehyde and acetylene served as active reagents.

The experiment began with the determination of the effect of the catalyst amount on the reaction rate. For this purpose, the aldehyde and the catalyst are 1: 1; 1: 2; 1: 3; The experiments were conducted at a ratio of 1: 4. The

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experiments were carried out in a solvent of equal degree (-10^{O}C) and equal volume. The results of the experiments show that in the experiments obtained in the ratio 1: 1, 1: 2, the target product - hexin-1-ol-3 production is low (15-17%) and its yield in the ratio 1: 3 is severe (38-39%). and 1: 4 does not change the target product's output. Consequently, for the synthesis of hexin-1-ol-3, the optimal amount of aldehyde and potassium alkali is 1: 3.

Subsequently, the effects of temperature on the interaction of acetylene with oil aldehydes were investigated. For this purpose, the aldehyde and catalyst were selected at a ratio of 1: 3, and the solvent at equal intervals of 5 h, and the rate of aldehyde injection into the reaction medium was 0.04 mol / h.

The data obtained from the experiments are presented in Table 1.

Table 1
Effect of temperature on the synthesis of hexin-1-ol-3

N	Temperature^{o}C	Productivity in%		
		Hexin-1-ol-3 Route I	Detsin-5-diol-4,7 Line II	5-oxyochtanal Line III
1	-20	38-40	6-8	-
2	-15	30-34	10-12	2-3
3	-10	32-34	17-19	6-8
4	-5	18-20	30-34	10-12
5	0	10-14	40-42	18-20
6	+10	4-5	30-32	25-30
7	+20	-	18-20	54-55

As can be seen from Table 1, the output of hexin-1-ol-3 at -20 ^{O}C is much higher, and is 38-40%. However, as the temperature rises (-10^{O}C), the target product's output (32-34%) will be relatively low. Consequently, as the temperature decreases, the acetylene concentration in the reaction medium increases with the reaction direction moving towards the synthesis of hexin-1-ol-3 (1). Further increase in temperature (+10^{O}C) will lead to a dramatic decrease in reaction I direction and a dramatic increase (40-42%) in direction II. Thus, increasing the temperature reduces the solubility of acetylene, while increasing the activity of carbonyl groups. As a result, a small amount of dissolved acetylene molecules is created for attack on both sides of the carbonyl group, and the yield of detsin-5-diol-4,7 increases dramatically. Increasing the temperature to + 20^{O}C causes a decrease in the concentration of acetylene in the reaction medium. Therefore, there is no formation of line I products, and the output of line II decreases sharply (18-20%). Finally, spontaneous condensation of the carbonyl group (III) increases the formation of 5-oxyoctanal-1.

III. CONCLUSION

Based on the results of the above experiments, the following conclusions can be made:

1. For the synthesis of hexin-1-ol-3 with high yield of secondary a-atylene alcohol, the catalyst with oil aldehyde should be kept at a ratio of 1: 3 and temperature at -10-12^{o}C.

2. As the temperature rises, the formation of complementary products - decin-5-diol-4,7 and 4-oxyhexanal is accelerated.

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