STUDY OF THE FORMATION OF SINGLEATOM UNSATURATED ALCOHOLS FROM ACETYLENE AND PHENYLACETYLENE

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ANNOTATION

Acetylene alcohol and phenylacetylene allow synthesis of essential substan-ces for the chemical industry - synthetic polymers, pharmacological preparations, agricultural pesticides, defoliants, plant stimulants. This article investigates the synthesis of tertiary alcohols based on acetylene and fenilacetylene, determined the conditions for their high yield, the structure of secondary and tertiary alcohols, confirmed by physical methods, and determined the refractive index, intensity, boiling temperature, fluid temperature and yield. Alcohol molecules are polarized due to the shift of electron cloud density towards the hydroxyl group in secondary and tertiary alcohols. The structure was confirmed by IK - and PMR - spectra.

Keywords : dimethylethynylcarbinol, phenyl dimethylethynyl carbinol, hexin-1-ol-3, dimethyl keton, positive induction effect, infrared spectrum, paramagnetic resonance, valence wave, deformation free functions, postpartum isomers, condensation reactions.

INTRODUCTION

In the chemical industry, acetylene homologs and aromatic hydrocarbons are used as organic paints, synthetic detergents, plastics and agricul-tural insecticides for the production of drugs and solvents [1]. The presence of three bonded carbon atoms in the benzene ring enables the production of valuable semiconductors in organic synthesis as a result of chemical changes [2].]. Phenyl-derived aromatic hydrocarbons have great potential in this field. Acetylene alcohols and their halogen derivatives are very important chemical and physiologically important substances. Pesticides, medicines, bactericides, stimulants and inhibitors were obtained from such substances [3,4,5]. The study of the synthesis and proper-ties of such substances, which are held by various substitutes in the molecule, has
attracted the attention of many chemists. The study of various functional properties of acetylene has both theoretical and practical implications. A new group of unsaturated multifunctional organic compounds is available to test. However, there is a lack of literature on the chemistry and physiological activity of such substances in the molecule holding and aromatic ring [6]. In the phenylacetylene molecule, the electron clouds are unevenly distributed, that is, from the phenyl radical to the tip. This is due to the hybridization of the carbon atom: sp^3, sp^2, and sp-hybridization increase the electromagnetic nature of the carbon atom. The carbon atom has sp^2-hydrogenation in ethylene - sp, phenyl radical. Due to the positive induction effect of radical in monoradically substituted acetylene (sigma), the electron cloud of the s-link is shifted to an unchanged carbon atom and this carbon atom is negatively charged. It facilitates the exchange reaction and the electrophilic reaction.

LITERATURE VIEW

The influence of acetylene and its monoradical deri-vatives on carbonyl compounds was studied by the Russian academician A, Favorsky in 1900. The effects of aldehydes and ketones with acetylene, including phenylacetylene, occur in the suspension of potassium hydroxide in anhydrous dehydrated diethylpyrene. This reaction is common for the synthesis of acetylene alcohol secondary and tertiary:

$$CH \equiv CH + O = C\,R\,R' + KOH \longrightarrow CH \equiv CH\text{-}COH(R\,R')\text{, here } R = R' = -CH_3\ ;$$

$$R = -CH_3,\ R' = -C_2H_5\ ;\ R = -H,\ R' = -C_3H_7\ ;\ R = -H,\ R' = -\text{izo}-C_3H_7\ ,$$

$$R - C \equiv CH + O = C\,RR' + KOH \rightarrow R - C \equiv C - COH(RR'),\ \text{here } R = -C_6H_5\ ,$$

$$R = R' = -CH_3\ ;\quad R = -C_6H_5\ ,\quad R = -CH_3\ ,\quad R' = -C_2H_5$$

Favorsky's reaction synthesizes aliphatic, alkylic, aromatic and geterocyclic acetylene and diacetylene alcohols and glycols, acetylene oxides and aminospirites. Industrial synthesis of isoprene, the first raw material for the synthetic rubber, is based on the Favorsky reaction.

The main purpose of this work is to obtain acetylene alcohols and to study their physical and chemical properties and to synthesize their halogenated products. The experiments performed were carried out in a 2000 ml sausage tube equipped with a mechanical mixer, reversible refrigerator, thermometer and drip funnel. The flask is prepared in 1000 ml of absolute dietilefirol with 200g of potassium hydroxide suspension, cooled at -5°-10 °C and purified acetylene gas. Acetylene gas is extra-cted by the hydrolysis reaction of calcium carbide in an autoclave and dehydrated by means of concentrated sulfuric acid. The reaction lasts for 10 hours and 100 ml of acetone is injected from the droplet drain during this time. To convert the potas-sium salt of the resulting yellow dimethylethinylcarbinol to alcohol, 100 ml of water is added dropwise from the drip funnel. The ether is extracted and the aque-ous part is extracted several times in dietilefir. The ether, which contains dimethyl-lethinylcarbinol, is purified by calcium chloride from water and extracted by distillation of acetylene alcohol.

Synthesis of phenylmethylethinylcarbinol. [7,8]

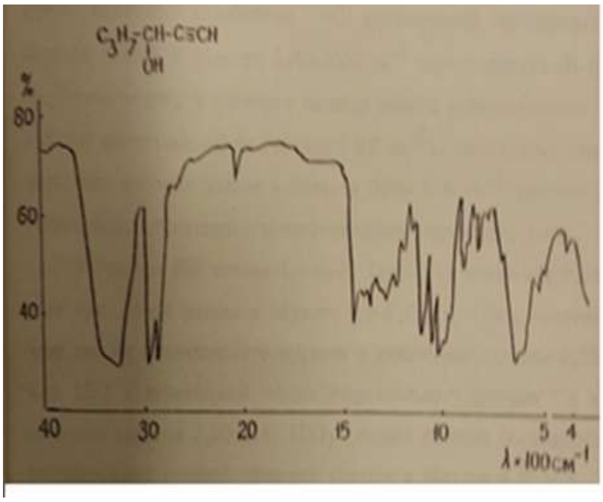
The alcohol reaction was carried out in a 300 ml tube containing three thermo-meters, a mixer and a rerefrigerator. A suspension of 20 g of potassium hydroxide and 250 ml of dried diethyl ester is prepared in the sausage. Dissolve the flask with ice on the outside and at a temperature of -5° - 10 °C, dilute 50 ml of dimethylphe-nyl with 5.8 g (0.1 mol) of dimethylketone and 5.6 g (0.055 mol) of phenylcetyle- ne for 8-10 hours. . The reaction mixture is cooled with ice and a guide-roll with 100 ml of water. The in -air part is extracted and the aqueous part is extracted several times with ether. The pooled air portion is dried with potash. To extract the acetylene alcohol, ether is extracted and the resulting alcohol is dispersed in a diffuser tube (25 cm in height).

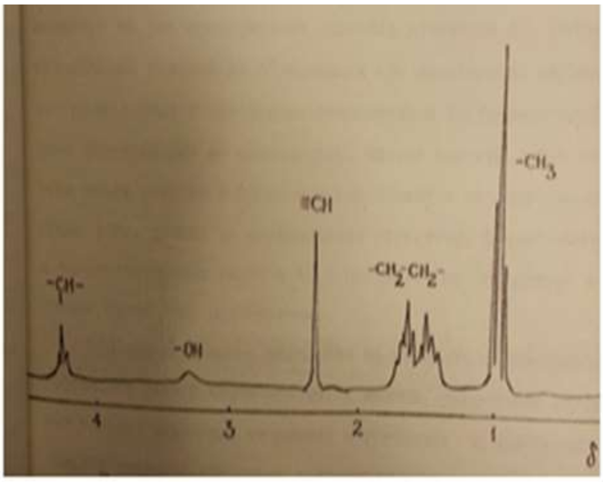
The reaction of acetylene condensation with aldehydes and ketones occurs in the Favorsky reaction with high yield 60-70%. Phenyl acetylene's tertiary alcohol yield is between 65 and

75%. The high yield of acetylene alcohol depends on the acti-vation of the reaction medium. The acetylene alcohol yield is 74.3% due to the addition of ethanol or normal butanol from the alkaline alcohols to the reaction mixture (1.0% of the KOH). Here alcohol acts as a carrier of potassium ions. In the reaction environment, the complex is formed by the formation of "solvent – acety-lene - potassium hydroxide". The solvent nature plays a major role in the formation of this complex.

The chemical structure of the obtained substances was confirmed by the infra-red spectral (IK) method. Valentized vibration of methyl and methylene groups in synthesized n-propylethinylcarbinol (Figure -1) 3000-2800 cm $^{-1}$, valence wave vibration of CO group 1200 - 1000 cm $^{-1}$, absorption curve of C≡C group 2200 -2100 cm $^{-1}$. The absorption curve of the valve vibration of the ≡C – H group corresponds to the acetylene group of 3315 cm $^{-1}$. The wide line available between 3450 and 3000 cm^{-1} represents the valence wave vibration of the -OH. In addition, near the 1400 cm $^{-1}$ area of the spectrum, the absorption curves for the deformation vibration of the methylene group are shown. It should be noted that the 3450 - 3000 cm $^{-1}$ absorption curves of the spectrum are characteristic for the hydroxyl group (OH-).

The triplet signal corresponding to the methylene group in the received PMR spectrum of hexin -1- ol- 3 (Figure- 2) is present in 0.9 - 1.0 mb (6H).





Picture-1. IK -spectrum of propylethinylcarbinol
Picture-2. PMP spectrum of propylethinylcarbinol

The proton-related signal in the acetylene group is 2.25 m.p. The signal of the proton at (1 H) and to the hydroxyl group is 3.20 m.p. (1H), the C -H group proton reacts with the hydroxyl group by 4.25 m.b. in triplet form, methylene group proton-related signals are 1.5 - 1.7 m.b. at a distance.

Physical and chemical characteristics of primary and products

№	Substance name	Mole-laughing mass.	Melting tem-pera type °C	Boiling temperature type	n^{20}_d	Density g / ml d^{20}_n	well %
1	Fenil-acetylene	102,14	-44,8°C	141.7°C	1,5492	0,9281	75
2	Dimetil-ethinyl karbiener	84	-	102-104°C	1,4211	0,8614	68
3	Metiletil-ethinyl karbiener	98	-	118- 122	1,4310	0,8692	15-97
4	H – propil-etinilkar-biener	97	-	87-88/ 10 mm. of mer.	1,4350	0,8710	75,9
5	İzopropil -etinilkar-biener	97	-	133-134	1,4352	-	68,1
6	1- phenyl- 3-methyl-butin-1-ol-3	160	-	147	1,4560	1,9320	74.1
7	1- Phenyl -3-methyl- pentin-1-ol- 3	174	161-162	-	1,4887	1.1658	66,2

An analysis of the data presented in the literature reveals that the optimal con- ditions for the formation of acetylene in the reaction of condensation of acetylene and its compounds with carbonyl groups are not determined. In addition, there is insufficient information on acetylene alcohols and their derivatives, chemical structure, physical and chemical constants and properties and the use of their products. In addition, there is insufficient information on acetylene alcohols and their derivatives, chemical structure, physical and chemical constants and proper-ties and the use of their products.

In tertiary acetylene alcohols there are polar bonds O - H and O - C and unal-located electron pairs. The chemical properties of acetylene are due to the hydroxyl (OH-) and ethinyl groups (-C ≡C-). Simple chemical properties of such surfaces occur with the presence of a hydroxyl group, where the ethylene group is conside-red to be radical and has no principal importance. However, under the influence of strong electrophilic reagents, ethylene groups such as the hydroxyl group may react. [9.10]. Acetylene does not exhibit acidity, which is clearly expressed in alco-hols. Acetylene alcohols have low acidity because they are tertiary alcohol. This is because of the donor properties of methyl groups (+ I effect), electron density is accumulated in the oxygen atom. Anion of tertiary acetylene alcohol has a strong base property.

CONCLUSION

The conditions for the formation of high acetylene alcohols in high yields were studied. The yield of acetylene alcohol depends on the nature of the solvent, temperature, catalyst and duration of reaction. It also depends on the degree of polarity of the aldehydes and ketones molecules.

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