



**BASED ON PARAFORMALDEHYDE AND ACETYLENE
BUTIN-2-DIOL-1,4, BASED ON METHYL ETHYL KETONE AND
ACETYLENE CATALYTIC SYNTHESIS OF 3,6-DIMETHYLOCTIN-4-
DIOL-3,6**

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Abstract

This article examines the development of technology for producing acetylene alcohols, aromatic diol, and their vinyl esters. As well as butin-2-diol-1,4 based on acetylene; The vinylation of 3,6-dimethyloctin-4-diol-3,6 and resorcinol with acetylene was studied at atmospheric pressure in the presence of two- and three-component high-base systems; the nature of the catalysts, the effect of solvents, and the temperature were determined.

Introduction

Paraformaldegid va atsetilen asosida butin-2-diol-1,4 ni, metiletilketon va atsetilen asosida 3,6-dimetiloktin-4-diol-3,6 ni katalitik sintez qilish

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Annotatsiya

Ushbu maqolada atsetilen spirtlari, aromatic diol va ularning vinil efirlarini olish texnologiyasi ishlab chiqish. Shuningdek atsetilen asosida butin-2-diol-1,4 ni; 3,6-dimetiloktin-4-diol-3,6 va rezorsinni atmosfera bosimida ikki va uch komponentli yuqori asosli tizimlar ishtirokida atsetilen bilan vinillash o'rganildi; katalizatorlar tabiati va erituvchilarning ta'siri, harorati aniqlandi.

Today, substances based on acetylene are widely used in the chemical industry, engineering and medicine, in plant growth control and the production of pesticides, in the light industry, perfumery, food, and other industries. Particular attention is paid to the creation of new medicinal substances based on vinyl ethers, unique polymers, high-quality solvents for radio engineering, substances and materials with specific properties, and the development of technologies for obtaining universal starting materials for directed organic synthesis.

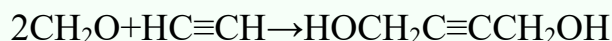
In the global chemical industry, the synthesis of vinyl compounds based on hydroxyl group-containing substances, including acetylene chemistry, specifically the vinylation process of active hydrogen-containing compounds, is aimed at obtaining difficult-to-synthesize vinyl compounds using two- or three-component high-base catalyst-solvent systems. Research is being conducted to implement such reactions, determine the physicochemical and operational properties of the synthesized compounds, and investigate the technological parameters and mechanisms of their production.

Today, in our Republic, great attention is paid to the production of chemical industry products and their introduction into economic sectors. The production of new types of defoliant for cotton leaf shedding based on local raw materials is of great importance in agriculture; a large number of acetylene diols and their vinyl esters have been synthesized, and certain results are being achieved in the field of determining their structure, electronic structure, reactivity, physicochemical properties, and biological activity.

The third direction of the Action Strategy for the Further Development of the Republic of Uzbekistan defines important tasks aimed at "developing agriculture, consistently strengthening the food security of domestic production, expanding the production of environmentally friendly products, and significantly increasing the export potential of the agricultural sector." In this regard, the creation of new types of

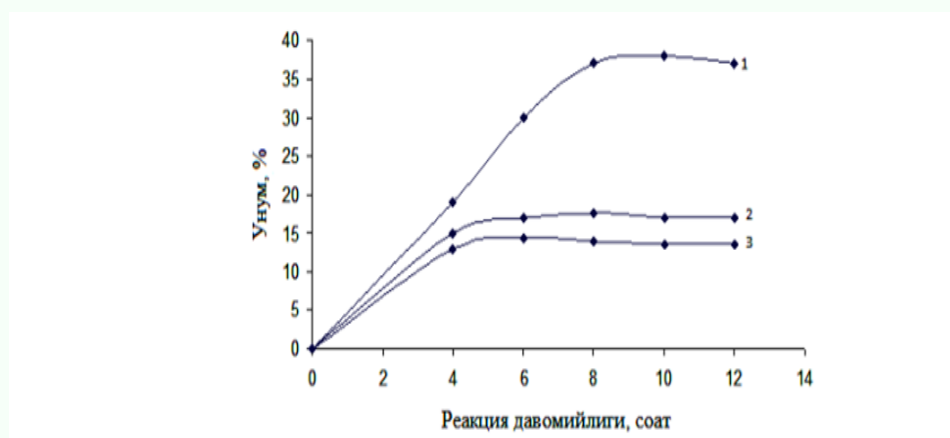
products that increase crop yields, accelerate their growth, and save water is of great importance.

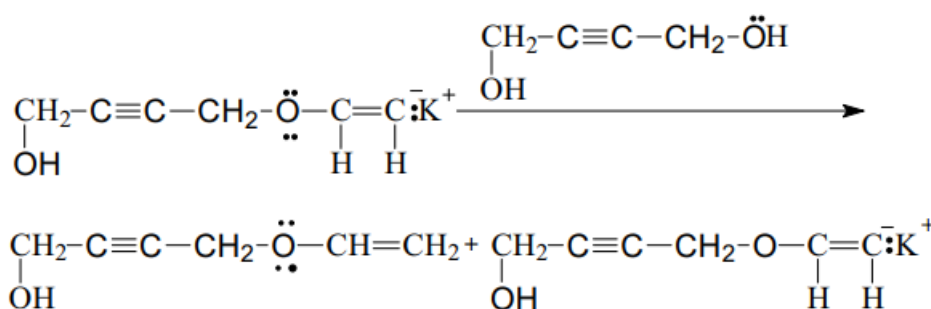
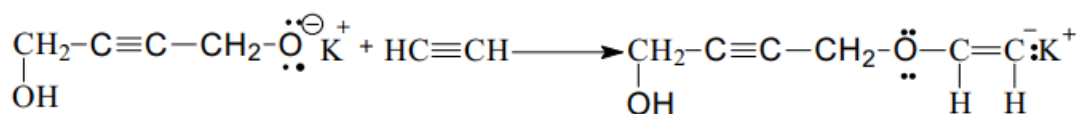
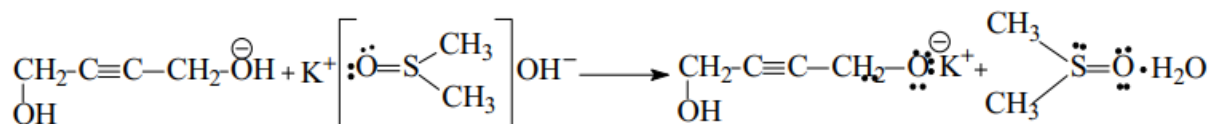
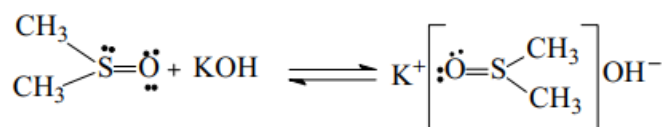
Based on paraformaldehyde and acetylene butin-2-diol-1,4, based on methyl ethyl ketone and acetylene catalytic synthesis of 3,6-dimethyloctin-4-diol-3,6, and as a comparative analysis of the results obtained resorcinol acetylene and vinylation reactions were also carried out. In this regard, in the literature known vinylation processes of saturated polyhydric alcohols base is accepted as . Acetylene diol used as the starting product butin-2-diol-1,4 in turn was synthesized according to the following scheme:



As noted above, for the synthesis of butin-2-diol-1,4, high catalysts with selectivity. Acetylene formaldehyde with salts or oxides of groups I-II, predominantly d-metals catalyzed by the formation of acetylenides is due to interruption. Therefore, for this process, it contains Cu catalysts with SiO_2 carriers and without carriers were selected. This catalysts were prepared by the absorption method or by introducing promoters. The composition of the catalysts used is as follows: CuO/SiO_2 50:50; CuO Cu 42.5%, Ni 7.5%, SiO_2 50%.

The activity of the catalysts was determined experimentally, and a catalyst containing Cu, CuO, Ni, SiO_2 showed high activity. Acetylene reaction with formaldehyde in an aqueous medium for 12 hours, the aforementioned catalysts with the participation of (Fig. 1).





The role of the KOH-DMSO system in the vinylation reaction is as follows: in the process forms a high-base dimethyl anion, which in turn the electrical conductivity of the solution, the degree of hydrogen bonding, etc. change the factors to ensure the reaction occurs. In the vinylation reaction of butin-2-diol-1,4 under optimal conditions its mono- and divinyl esters are formed with a yield of 33.2% and 54.3%, respectively. Synthesis of monovinyl ester of butin-2-diol-1,4 the kinetics of the process were studied, the nature of the solvent and the catalyst effects were detected. The solvents for the reaction are benzene, dioxane, DMSO and DMFA, and LiOH, NaOH and KOH as catalysts applied (Table 1)

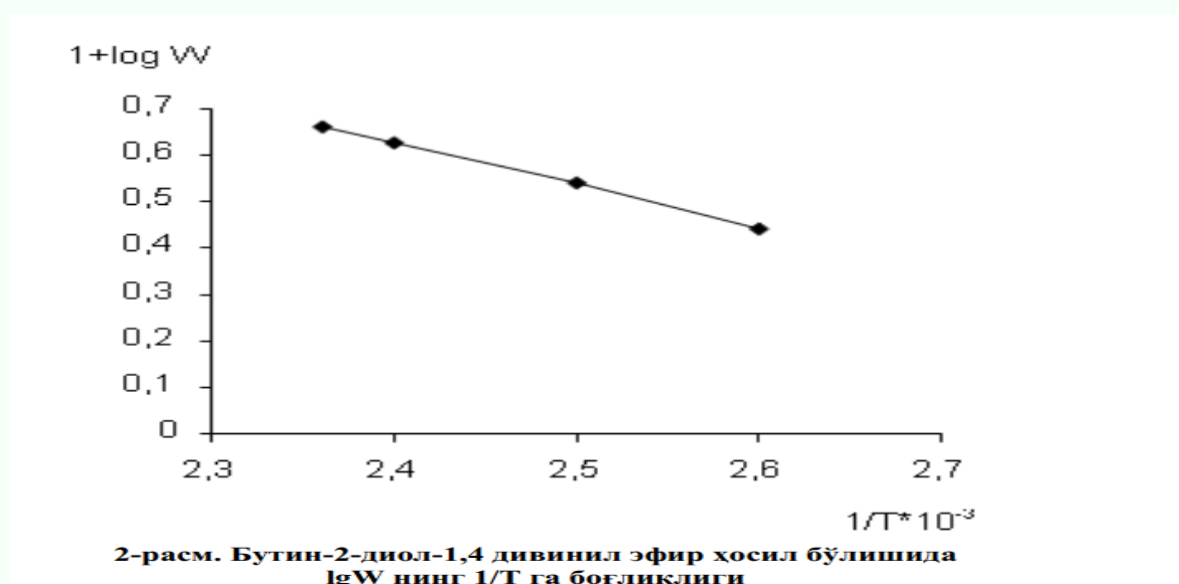
Table 1 Influence of the nature of the catalyst on the yield of but-2-diol-1,4 vinyl ethers

Catalyst	Yield of but-2-diol-1.4 vinyl esters, %	
	monovinyl ether	divinyl ether
LiOH	24.2	36.8
NaOH	35.3	38.4
KOH	38.1	43.4

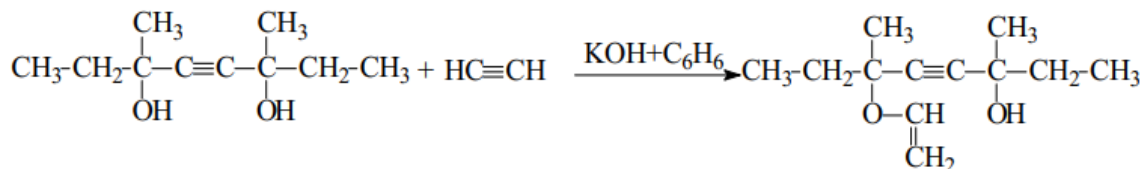
The results obtained show that the nature of the catalyst influence the yield of mono- and divinyl esters of butin-2-diol-1.4. The used catalysts are arranged in the order $\text{LiOH} < \text{NaOH} < \text{KOH}$ increases, and the yields of monovinyl ether are 24.2; 35.3 and 38.1%, and for divinyl ether 36.8; 38.4 and 43%, respectively.

Thus, under the conditions of vinyl ester synthesis, dimethyl sulfoxide it was found that KOH is the most active catalyst in the synergetic system. Influence of the amount of the catalyst KOH on the yield of vinyl ethers butin-2-diol-1.4 in the range of 2-10% by weight. Catalyst butin-2-diol-1,4 monovinyl ether 34.0 to 24.0%, respectively, while the yield of the divinyl ether is will increase by . This state is caused by the initial formation of monovinyl ether in the reaction, followed by a transition to divinyl. Divinyl ether yield reaction leading to a decrease in the yield of monovinyl ether will come.

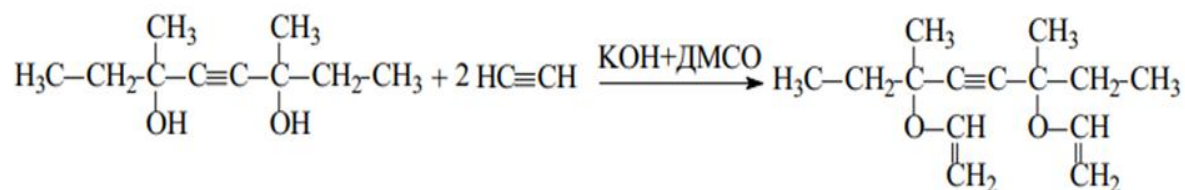
Based on the results obtained, the kinetics of this process were studied. Arrhenius equation by graphing the dependence of $\lg W$ on $1/T$ (Fig. 2) butin-2-diol-1,4 divinyl ether energy was determined, and its value is 51.7 kJ/mol.



Synthesized 3,6-dimethyloctin-4-diol-3,6 with acetylene in the presence of a KOH catalyst and KOH-DMSO vinylation reaction was investigated. There is only one reaction. a hydroxyl group, mainly monovinyl ether is generated:



The product yield was 25.6%. During the reaction, as well as Divinyl ether of acetylene diol was formed in an amount of 5-10%. KOH that the catalyst is poorly soluble in the solvent the inability to fully manifest itself, the production of vinyl ether with low yield causes to occur. Reaction in a super-basic medium KOH-DMSO system, the formation of the studied diol's divinyl ether was observed as the main product:



At 97-100 °C in the presence of 20% KOH relative to the amount of diol divinyl ether is formed with a yield of 53%, which corresponds to the amount of KOH At 50%, it was 57%. Reaction temperature 120-125 °C increases the yield of divinyl ether by up to 55% arrived. As the temperature increases, the yield of the divinyl ether decreases, acetylenediol under the influence of an alkali at a high temperature partial decomposition into acetylene and ketone. To determine the influence of temperature on the vinylation process reaction of 3,6-dimethyloctin-4-diol-3,6 with acetylene at a temperature of 60-120 °C was studied (Table 2).

Table 2. mono- and divinyl esters of 3,6-dimethyloctin-4-diol-3,6 effect of temperature

№	Temperature, °C	Yield of diol vinyl ether, %	
		monovinyl ether	divinyl ether
1	60	11,2	18,5
2	70	13,0	26,0
3	80	14,5	35,6
4	90	9,6	41,4
5	100	-	46,4
6	110	-	43,0
7	120	-	32,4



The results show that at relatively low temperatures (60-90°C) A mixture of mono- and divinyl esters of 3,6-dimethyloctin-4-diol-3,6 will be formed. In all cases, the yield of the divinyl ether is reduced to the monovinyl ether relatively high. Increasing the temperature to 60-80 °C from 11.2 to 14.5%, and increasing the temperature to 90 °C This led to a decrease to 9.6%. Thus, 3,6-dimethyloctin-4-diol-3,6 the formation of monovinyl ether during catalytic vinylation, is the limiting step of the reaction. The kinetics of the reaction were studied, and based on the results Activation energy of the vinylation reaction of 3,6-dimethyloctin-4-diol-3,6 whose value is 9.5 kJ/mol.

When vinylation the studied compounds with acetylene, two using high-base systems such as component MeON-DMSO the formation of vinyl ethers with relatively high yield and the reaction allows you to increase your speed. Further substantiation of such systems strengthening by adding a third component to them: alkali metal fluorides will be performed using.

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