



DETERMINATION OF THE HARDENING PROCESS BY THE GEL FRACTION METHOD

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ABSTRACT

Furan extraction through recycling of industrial agricultural wastes reduces the level of environmental pollution with biodegradable wastes, problems encountered in the production of furan soolegomers, predetermined chemical properties of polymers and production, detailed discussion of the importance and prospects of furan industrial production, to study the process of solidification of furfuryl soolegomers by the method of gel fraction and to search for solutions experimentally.

INTRODUCTION

Relevance of the topic: We know that the development of ways to use plastic polymer products as a raw material for industry through the collection and recycling of biodegradable waste, which is currently used all over the world, has not been widely studied. is set to 1. In particular, Uzbekistan spends a lot of money every year on solid waste disposal, which is not biodegradable and can harm the environment in the long run. In Uzbekistan, 14% of plastic waste is recycled annually. The process of burning plastic waste also leads to severe air pollution. Because plastic polymers are derived from petroleum sources, it is possible to convert them into fuels. It is noteworthy that the future launch of such technologies could be another new solution to meet the demand for fuel. In short, converting plastic polymers into a transport fuel through a low-pollution recycling process can also save money in the fight against environmental pollution. The method of thermolysis has been found to be more efficient and environmentally efficient in reducing plastic waste in the process of melting plastic polymers through a bio-solvent. In the article you can comment on the effectiveness of such a bio-melting process, the processes of synthesis of such bio-soluble furfuryl alcohol and oligomers from it, and the effect of various plastic polymers on bio-solvents. There are also analyzes on the technical characteristics of the conversion of polymers into fuel using all-round suitable and optimal technologies for modern fuel production. We will also focus in detail on our future research on the use of polymer waste as a resource, the development of

alternative fuel recycling technologies, and ways to effectively reduce environmental pollutants.

The main content of the study is to conduct a feasibility study for the production of fuel from plastic waste. Currently, almost all countries are conducting research on the conversion of plastic waste into energy, and in this study, researchers are mainly working on the use of pyrolysis to convert plastic into a liquid oil. The main focus of this study is to study the biochemical analysis of the physicochemical properties of Furfuryl alcohol and to study the adverse effects of furfuryl sooligomers on the rapid alloying process. Through this research, the effect of polymers on the reactive reaction process, which can be used as a bio-solvent, and the development of acceptable technological processes.

Furan is a cheap raw material, it is obtained by recycling household waste and is added to concrete, ceramics, metals in industrial construction, because furan is chemically resistant to corrosion, alkali, heat-resistant adhesive. China and Japan are the leaders in the waste recycling industry. China produces 80% of the world's furfuryl in terms of natural furfuryl alcohol production.

Furfuryl (C₅H₆O₂) This is an alcohol containing furan, which is exchanged with the hydroxymethylene group. Colorless (old samples are yellow in color) Stable in water with unpleasant odor and bitter taste, soluble in organic solvents (boiling point 171 ° C density 1.13 g / cm³)

Condensation of furfuryl alcohol, C₉-C₂₅ compounds formed as a result of the reaction, can be used as an intermediate raw material for the production of biofuels. The molecular structure and composition of short-chain C₉-C₂₅ oligomers of furfuryl alcohol were determined by gas chromatography-spectrometry (GC-MS) and, accordingly, gas chromatography, molecular weight of condensate, gel permeability chromatography. Based on the data provided by GC / MS and GPC, we found that the condensation of furfuryl alcohol in an aqueous system is a combination of two polymerization mechanisms, stepwise polymerization and chain growth polymerization. A simplified kinetic model was created based on existing mechanisms, and condensation products were obtained from short-chain oligomers C₉-C₂₅.

Synthesis of furan oligomers

1. Poleazomethines and thiophene are chemically synthesized products with furan groups, formed by oxidative polymerization in the presence of Fe (III) chloride. . The structure and elemental analysis of dosed polezometins were studied by IR-Fourier and X-ray photoelectron spectroscopy, UV-spectrometry and DSC methods. The permeability of polyazomethins is $<10^{-8} \text{ s} \cdot \text{cm}^{-1}$, dosed $-10^{-7} - 10^{-6} \text{ cm} \cdot \text{cm}^{-1}$. Low permeability values are due to the unevenness of the polymer chain of polyazomethines and are associated with low levels of conjugation. During the preparation of thiophene-containing polyazomethines, it was found that the rupture of conjugation in the polymer chain under the influence of sulfur occurs with a decrease in electrical conductivity.

Furan derivatives (2-methylfuran, 2-tert-butylfuran) can be used to synthesize block-SPL and functional polymers. These substances can be used in the synthesis of polyisobutylenes functionalized by solution in the presence of TiCl₄ or BCl₃ in a mixture of CH₂Cl₂ or CH₂Cl₂ / CH₃Cl, and this process takes place at -80-40 °. Formation of polymers with stable

allyl cations under such conditions detected. The use of furan derivatives makes it possible to obtain block SPLs with star-shaped molecules.

2. The use of anodic technology is an effective method for grinding 2-bromo- and 2, 5-dibromofuranes. Highly selective trimethylchlorosilane and diorganodichlorosilane, Furilsilanes, bromofurylsilanes, bisfurylsilanes, bisbromofurylsilanes, furylchlorosilanes, bisilil- and chlorosililfuranes, oligomers of silanylenophyrylene 2 in the presence of silanylenefurylen 2, oligomers of silanylenefurylen.

The bonding between the polymers maleimide and furan was carried out using a Diels-Alder solution. Maleimide and furan groups are added to the side chains of poly-2-methyl-2-oxazoline. Polymer hybrids are filled with a sol-gel solution catalyzed by the above modifications of tetramethoxyxane. The passage of the polymer Diels-Alder region is confirmed by IR with UV spectra and Fourier transformation. Resistance to p-receptors of polymer hybrids was found to increase with the formation of VPN-structure.

CONCLUSION DISCUSSION

The gel fraction is the mass fraction of the material that forms the network, a single molecule that covers the entire volume of the material samples, a three-dimensional polymer network.

Gel fraction (%) = $M_{d, 2} / m_{d, 1} \times 100$

It is aimed at determining the mass fraction of $m_{d, 1}$ of the total volume $M_{d, 2}$.

This results in the formation of high-molecular compounds with a hydraulic chain.

A significant increase in the gel fraction content in high-density polyethylene with increasing temperature should be explained by a significant increase in the mobility of molecular chains, which leads to a significant increase in the contribution of molecular crosslinking. The next increase in the composition of the gel-fraction

> Condensation

> Neutralization

> Drying

This results in the formation of high-molecular compounds with a hydraulic chain.

Experiment 1

1. Course of the experiment: First of all, we studied the physicochemical properties of furan and the required reagents and determined their values required for the reaction.

1. Molar mass of products

30 mol monoethylol phenol ($37 \cdot 124$) 3720

30 mol dimethylol phenol ($30 \cdot 154$) 4620

60 mol suv ($60 \cdot 18$) 1080

GSG Hydroxyl Protective Polyol (1500)

The total molecular mass is 9840 gr if we take into account the water leakage during the reaction 8760 gr.

2. We take two test tubes and add 0. 1-0 to the first test tube. We put 2 g of oligomer on the analytical balance with an accuracy of 2 g 0. 0002 g, then put 2-4 g of camphor on it and compact it well. Dilute the plate to 180 ° C and wait until a clear solution is formed and cool the resulting solution to room temperature.

The reaction is carried out in a nitrogenous medium in a four-mouth flask DEG 116.7 g, Zinc acetate 0.474 g is added, stirred and placed on a plate for about 10 minutes when the

temperature reaches 110 ° H. At 5 minutes, the color of the liquid turns yellow. Due to the fact that the reaction is carried out in a nitrogenous environment, nitrogen is released into the air. The acid dissolves in 10 minutes at a temperature of 165 ° C, and water vapor is released into the air. Then, in 20 minutes, when the temperature reaches 195 ° C, the reaction takes 6 hours at this temperature.

Experience. 3 Obtaining high molecular weight compounds by PEP and furfuryl alcohol PEP - 1 mol m. m-19. 91, Furfuril alcohol 100 mol 130 gr, total mass 150 gr The resulting reagents are placed in a flask, the catalyst is added in different amounts every three hours, the temperature is reached at 140 ° C, the next amount of catalyst is added and the reaction is carried out in the same order.

Aldehyde-reduced furfural can be used to synthesize furfural-acetone monomer without additional purification, to determine this we have studied some laws of condensation of furfural with acetone. Furan is mainly formed in the first 5-20 minutes. As the process duration increases, a slight redistribution of the Furan yield occurs: the mono-FA (MFA) content decreases and the di-FA (DPA) content increases. The viscosity of the reactions also increases and the mass associated with the partial solidification of furfural and the reaction of furfural with acetone changes.

It is known that the rate of formation of both MFA and DPA is directly proportional to the reaction temperature, and MFA is formed 6 times faster than DPA under the conditions studied. It was found that from all samples of furfural corresponding to grades I and II were obtained 96-99.9% Furan monomer in the main substance, monomer with high DPA (more than 30%). If the content of the main substance in the furfural samples is less than 96%, a decrease in the DPA content in the monomer is observed to 18%. This is mainly due to the presence of compounds in furfural. The duration of the process depends on the reagent ratio, the reaction temperature, the amount of QD, and the effect of the initial furfural on the rate of PA formation. Analysis of this process made it possible to optimize the PA production process. It is known that when furfural containing 85-95% aldehyde is used to obtain an FA monomer with a DPA content of more than 30%, it is possible to ensure the formation of DPA at a rate of 0, 03-0, 01 mol. . The conditions of the PA production process allow the use of furfural with reduced furan aldehydes

A common problem in practice is that thermally removable polyurethanes are prepared as follows. Initially, furan compounds and additives of alcohols are synthesized. Polyols are obtained by the reaction of the additives with bismaleimide, the polyols react with diisocyanates to form a gel at temperatures above 90 °, and when cooled, solid Polyuratin is obtained when heated to EKVIV10 minutes due to the physical properties of Polyuratin. Depolymerizes in solvent at temperatures above 90 °.

In the process of pseudocation polymerization of furfuryl alcohol in iodine-initiated methylene chloride, a colored, amorphous, branched polymer is formed, the structure of which is the same as the poly-FS structure obtained using Bronsted and Lewis acids as initiators.

Polyurea containing furan rings is synthesized by polycondensation in an aliphatic solution of difurandiamine. Subsequent conversion of the obtained products into polyparabic acids is carried out by heterocyclization of them with oxalin chloride.

CONCLUSION

The solidification process of furfuryl soolegomers is formed as a result of spontaneous polyfcondensation of monomers. Furfuryl alcohol molecule reacts with the active α -hydrogen in the presence of an acid catalyst. The importance of the acid type in the hardening process of furfuryl alcohol The intensity of the acid determines its rate of solidification, for example, when solidified at room temperature under the action of sulfide acid, weak acid anhydride malis anhydrite, the reaction under the action of phosphoric acid slows down and furfuryl does not solidify.

Furfuryl alcohol The use of furfuryl alcohol resins is widespread in the industry, mainly furfuryl alcohol is currently one of the best solvents of high molecular weight polymers. Furan alloys can replace traditional formaldehyde. Furan alloys react easily with phenols in the presence of an alkaline catalyst to form phenol-furfural resin. In the presence of furfuryl acid catalysts, oligomers with a liquid linear chain are formed or homopolemerized. The chains formed in this way consist of methylene in the middle of the furan and dimers and trimers. The processing process is considered exothermic, for which the specific temperature conditions should be in the range of 5-8 in the liquid refrigerant pH. from furfuryl aldehydes to phenols in the presence of formaldehyde, and copolymerization with urea. In industry, furfuryl alcohol is obtained by hydrogenation of furfuryl. The technology of obtaining furfural from different manufacturers differs only in the preparation of the initial mixture, Conventional furfural oligomers are obtained by polycondensation of furfuryl alcohol in the presence of water and malleic anhydride.

It is not observed that the change in the composition of Furfural Sooligomers depends on the gel fraction. In the process of copolymerization of polyester modified with cyclopentadiene only, the content of the insoluble fraction gradually increases from 10 to 140 Mrad. This is due to the introduction of copolymerization of the endomethylene - the double bond of the trahydrophenic cycle.

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