IN THE SYNTHESIS OF E-3 BRAND ORGANIC COMPOSITE ADDITIVES CONTAINING EPICHLOROHYDRIN, SODIUM ACETATE AND OXYGEN COMPOUNDS EFFECT OF CATALYSTS STUDY OF IR-SPECTROSCOPY

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Abstract: *Most cars and trucks and some aircraft are equipped with positive-ignition piston internal combustion engines. Depending on the nature of the fuel , these engines are divided into liquid and gaseous fuel engines, four-stroke and two-stroke engines according to the method of filling the cylinder with a clean charge. Spark-type internal combustion engines typically use a carburetion process to convert liquid fuel into vapor and mix it with air , which involves breaking the liquid fuel into small droplets, intensively mixing it with air, and vaporizing it. A common device is the carburetor, which The process of preparing the fuel mixture in piston engines is carried out by spraying it inside the engine using a carburetor.*

Keywords: *organic esters, additives, IR-spectroscopy, epoxide group, ionic liquid triethylbenzylammonium chloride, aluminum chloride, silicon oxide*

It was planned to obtain organic esters using the interaction of sodium acetate and epichlorohydrin. A 500 mL three-necked flask was equipped with a reflux condenser, a thermometer, and a stirrer for the reaction process. During the reaction, 100 g of sodium acetate was placed in a flask, 100 g of epichlorohydrin was added to it with continuous stirring, and the reaction was stirred at a temperature of 105-110 ^{o}C for 3 hours. 0.2% ionic liquid was used as a catalyst in the reaction. The resulting mixture was washed several times in water to dissolve water-soluble substances and dried at a temperature of 50-60 ^{o}C. The yield of the product was 82%. The structure of the obtained organic esters with oxygen, which increases the octane number, was studied using IR-spectroscopy analysis.

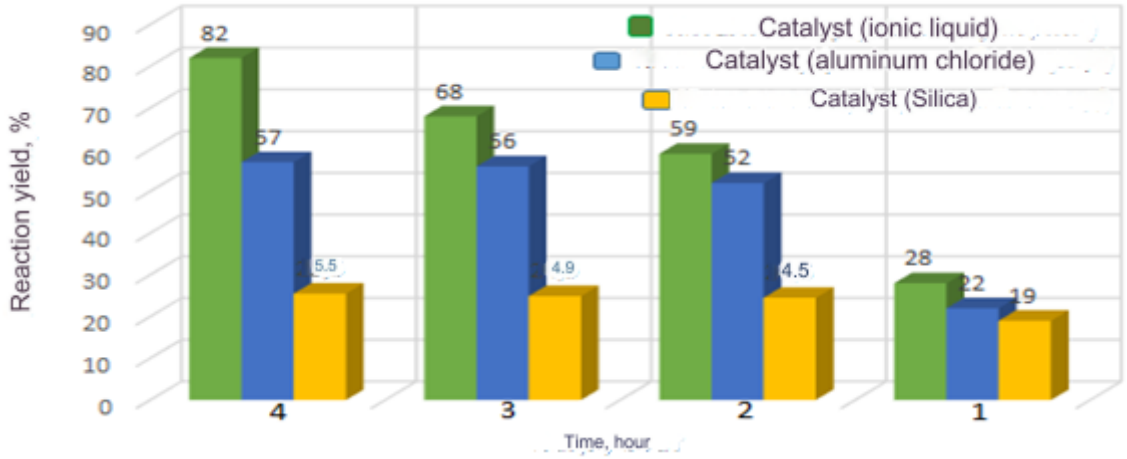


Figure 1. Effect of catalysts on reaction yield in preparation of organic esters using interaction of sodium acetate and epichlorohydrin.

sodium acetate and epichlorohydrin were studied. According to the results of the

experimental test, the mass ratios of organic esters with oxygen content that increase the octane number were obtained as follows: sodium acetate and epichlorohydrin. a) 1:1; b) 0.5:1; c) consists of 1:0.5. One of the main factors affecting the yield in the reaction process was found to affect the reaction rate by changing the mass ratio of epichlorohydrin. The effect of temperature on the reaction yield in the preparation of organic esters using the interaction of sodium acetate and epichlorohydrin when analyzed (Fig. 1), it was found that the reaction yield is low in the temperature range of 50-70 ^{o} C. But when the reaction is carried out at a temperature of 100-110 ^{0} C, we can see that the productivity has increased. When studying the effect of catalysts on the reaction yield in obtaining organic ethers using the interaction of sodium acetate and epichlorohydrin (Fig. 2), it was observed that the reaction rate and yield increase uniformly with an increase in the mass of epichlorohydrin and an increase in temperature to 100-110 ^{o} C. The effect of catalysts (ionic liquid triethylbenzylammonium chloride, aluminum chloride, silicon oxide) on the reaction yield of sodium acetate and epichlorohydrin in a ratio of 1:1 was studied. As a result, it was found that the ionic liquid has a high productivity .

The structural structure of ethers with epoxide group obtained on the basis of epichlorohydrin and sodium acetate was analyzed by IR-spectroscopy.

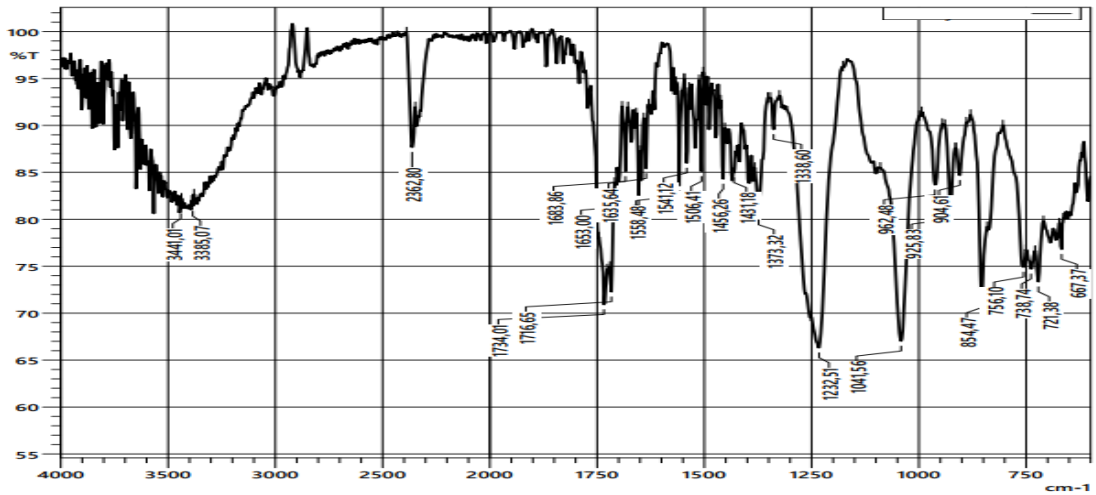
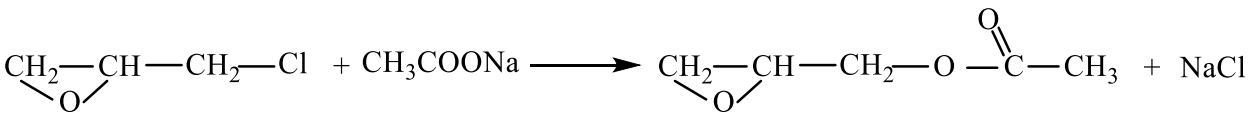


Figure 2. IR-spectroscopy of esters with epoxide group obtained on the basis of epichlorohydrin and sodium acetate.

epichlorohydrin and sodium acetate (CH_3COONa):



When we analyzed the IR-spectrum, it became clear that the main change in absorption areas corresponds to the areas of 1737 cm $^{-1}$ and 1232 cm $^{-1}$. These absorption bands are the corresponding frequencies for the C=O carbonyl and S-O-S acetate groups characteristic of complex esters. In the analysis , the asymmetric valence vibrations of the epoxy group were invisible in the 756-854 cm $^{-1}$ region.

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