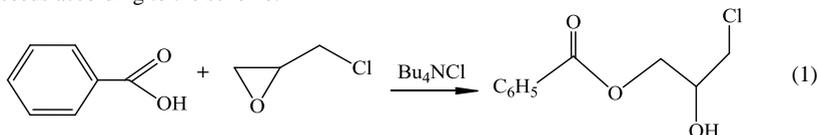


**THE INFLUENCE OF THE SOLVENT POLARITY ON THE CATALYTIC ACTIVITY OF TETRABUTYLAMONIUM CHLORIDE IN THE SYSTEM "BENZOIC ACID – CHLOROMETHYLOXIRANE"**

*Bakhalova E.*, Hembaruk V., Kazakov O., Shved E.  
Vasyl' Stus Donetsk National University, Vinnytsia, Ukraine  
je.bahalova@donnu.edu.ua

The reaction of carboxylic acids with (chloromethyl)oxirane (epichlorohydrin, ECH) is used in the synthesis of glycidyl carboxylates, which have different application, for example in the synthesis of epoxy resins. The presence of aromatic cycle in the structure of benzoic acid is its advantage over other carboxylic acids, because it ensures the thermal stability of the products. Quaternary ammonium salts are effective catalysts the acidolysis of ECH. An important feature of the reaction was found in previous studies. It has been determined that real reaction catalyst is intermediate compound – carboxylate quaternary ammonium. Based on the above the studying of reaction's mechanism and the behavior of the quaternary ammonium salts are the actual problem.

The purpose of this work is investigation the reactivity of benzoic acid in reaction with 2-(chloromethyl)oxirane in the presence of tetrabutylammonium chloride. The reaction proceeds according to the scheme:



It has been selected benzoic acid as the protonodonor nucleophilic reagent, tetrabutylammonium chloride as the catalyst of reaction (1). The concentrations of catalyst have changed from 0.00125 M to 0.00500 M, benzoic acid 0.200 M. ECH is taken in significant excess and is both a substrate and a solvent at the same time. The study was carried out at 60 °C in a binary solvent epichlorohydrin: tetrahydrofuran (1:1, vol.%). The progress of the reactions was monitored by measuring the concentration of carboxylic acid by potentiometric acid-base titration.

According to the results, it has been determined the first reaction order for catalyst and zero reaction order for acid. The kinetic law of reaction has been established. The rate constants of the non-catalytic and catalytic steps were found. It is determined that the reaction is several orders of magnitude quicker in the presence of tetrabutylammonium chloride than in the absence of ones. Comparison of the obtained data with the results obtained in the more polar solvent – ECH shows that a decrease in the polarity of the solvent leads to a decrease in the reaction rate.