The Decelerating Influence of Dithiocarbamic Acid on the Oxidation Process of S-(2,4,6,Trimethylbenzyl)-O-Ethylxanthate Ether

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In order to study the mechanism of influence on the oxidation process S-(2,4,6-trimethylbenzyl)-O-ethylxanthate ether has been synthesized.

![Chemical structure of S-(2,4,6-trimethylbenzyl)-O-ethylxanthate ether]

The physiochemical characteristics of [A] substance has been studied and it conforms to the reference data. [A] – C₁₃H₁₈O₂S₂ – yield 8.4%, boiling temperature – 73 -78.4 – 77/50 Pa, S-has been found as 25, 39 and has been calculated as 25,54. The mechanism of the interaction between [A] substance and cumene hydroperoxide (CHP) has been investigated. It has been established that the synthesized ether – [A] – actively decomposes [CHP] by autocatalytic method in nitrogen medium in chlorbenzene solution at 70-100°C. The catalytic reaction, i.e. the number of the decomposed (CHP) molecules on a monomolecular inhibitor to several thousands (3,6 . 10³ molecule).

It has been determined that the autocatalytic decomposition of cumene-hydroperoxide occurs not under the influence of the synthesized inhibitor itself but of the products obtained sue to its conversion during the oxidation process.

According to the reagent the kinetic parameters such as reaction composition the rate constant, and the activation energy have been determined. The investigated [A] substance decelerates not directly but indirectly the oxidation process as a free antioxidant and decomposes the generated by hydroperoxide by a catalytic method.

The autocatalytic behavior of [CHP] decomposition asserts the formation of a catalyst during the process and the next stage of the reaction occurs involving it. The decomposition process of [CHP] involving the investigated inhibitor can be divided into two stages. At the first stage the reaction between the reagents progresses very slowly and this is characteristic by an induction period. This is the stage of the generation of active decomposers (catalyst) of hydroperoxide. At the second stage the generated active decomposers decompose hydroperoxide by a catalytic method. So the autocatalytic decomposition of [CHO] occurs not under the influence of the inhibitor but of the products obtained due to its conversion during the oxidation process.

It has been first determined in the carried out experiment that an acid generates during the reaction involving [CHP] and [A]. the maximum concentration of the acid corresponds to the maximum titration value of the decomposition rate. That’s the generated acid forms a catalyst. Indeed, mainly by injecting pyridine into the system [CHP] the decomposition reaction stops under the influence of ethylxanthate ether.