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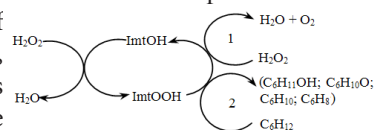
Mechanism of biomimetic monooxidation of cyclohexane by hydrogen peroxide

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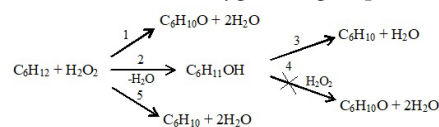
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The inducing effect of hydrogen peroxide on synchronous monooxidation reaction of hydrocarbons in the presence of biomimetic catalysts is accompanied by two interrelated and interacting-coherent reactions. The decomposition reaction of H_2O_2 (primary) forms a biomimetic catalytic intermediate, in the interaction of which with the substrate, its transformation occurs in a secondary reaction-coherently, synchronized with it. The mechanism of such coherent-synchronized reactions is considered in the process of heterogeneously catalyzed monooxidation of cyclohexane by hydrogen peroxide in the gas phase in the presence of a biomimetic catalyst, which is described by the following generalized scheme:



It follows from this scheme that the primary H_2O_2 decomposition reaction forms highly active hydroperoxide active center ImtOOH, which interacts with cyclohexane by forming the desired products (secondary reactions) - $C_6H_{11}OH$, $C_6H_{10}O$, C_6H_{10} and C_6H_8 . As a biomimetic catalyst was used per-FTPhPFe(III)OH/ Al_2O_3 , which synthesized based on the iron-porphyrin complex, simulating the catalytic functions of the enzyme of the oxoreductase-catalase and monooxygenase group, which are distinguished by their selective and highly active action and necessary for the creation of effective biomimics. Experimental study of the monooxidation reaction of cyclohexane shows that the process of formation of cyclohexanone, cyclohexanol and cyclohexene proceeds along a sequentially parallel mechanism, which can be represented as the following scheme:



Each stage indicated in this scheme proceeds according to the previously described coherently synchronized mechanism

Biography

T Nagiev is the Vice-President of Azerbaijan National Academy of Sciences, the Director of Research Center of Azerbaijan National Encyclopedia and also, the Department Chief of Nagiev Institute of Catalysis and Inorganic Chemistry of ANAS. He is a Professor of the Department of the Physical and Colloid Chemistry of Baku State University.

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