

2nd European Organic Chemistry Congress

March 02-03, 2017 Amsterdam, Netherlands

Coherent-synchronized reaction of oxidation of pyridine "green oxidants"-H₂O₂ and N₂OT M Nagiev¹, I T Nagieva² and N I Ali Zadeh¹¹Nagiev Institute of Catalysis and Inorganic Chemistry, Azerbaijan²Baku State University, Azerbaijan

The methodology developed gas-phase oxidation of various hydrocarbons and their derivatives, their reaction with coherent-synchronized decomposition reaction of hydrogen peroxide and nitrous oxide, which generate in an environment highly intermediates - O, OH, HO₂ radicals, yielded a number of practically important compounds, with relatively high yields and selectivity at atmospheric pressure without using special catalysts. This methodology was first used for the selective oxidation of nitrogen-containing heterocyclic compounds. As a model reaction used coherent-synchronized oxidation of pyridine (P) in the temperature range: Hydrogen peroxide (300-500°C) and nitric oxide (530-620°C). As a result of experimental studies the scientific bases of synthesis of 2,2-oksodipiridyl are designed by oxidation of pyridine with hydrogen peroxide. This way the selective production of 2,2-oksodipiridyl (fig.1) is free from a number of disadvantages inherent in the known methods of catalytic oxidation of pyridine. Substantial interest undoubtedly presents practical important synthesis of pyridine bases by the "green oxidant" - nitrous oxide by free-radically mechanism. Experimental studies have shown that in the temperature range 530-620°C pyridine occurs selective oxidation reaction with nitrous oxide to form 2,2-dipiridyl (23.0 wt%) and 2,3-dipiridyl (25.4 wt%) [4,5]. Kinetic curves presented in fig. 1 and 2 clearly show us a unique opportunity to obtain valuable practical pyridine bases, according to the simplified technology.

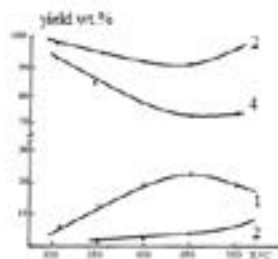


Fig.1: Effect of temperature on the yield of reaction products: 1 - 2,2-oksodipiridil; 2 - molecular oxygen; 3 - 2-pyridone; 4 - unreacted P. The concentration of H₂O₂-35wt.%, the feed rate P-0,47ml/h, the volume ratio of P: H₂O₂=1:3

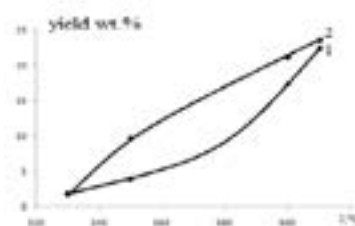


Fig.2: Effect of temperature on the yield of the reaction products (flow rate P-1.896 ml/hr, N₂O flow rate-250 ml/hr). 1-2,2-dipiridyl, 2,3-dipiridyl

Biography

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

tnagiev@azeurotel.com