

«KRASUSKY'S RULE» AND ITS APPLYING IN MODERN ORGANIC SYNTHESIS

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Introduction. Professor Konstantin Adamovich Krasusky (1867-1937) is a famous Soviet scientist in the field of organic chemistry, associate-member of the USSR Academy of Sciences (1926), academician of the National Academy of Sciences of Ukraine (1933). He made a significant contribution to the organic synthetic chemistry in Ukraine. K.A. Krasusky led the Organic chemistry course (1922-1924) in Kharkiv Pharmaceutical Institute (now National University of Pharmacy) in cooperation with work in Kharkiv University. He engaged in aminoalcohols synthesis from α -oxides. Moreover, he investigated the mechanism of the interaction of ammonia (amines, hydrogen chloride) with α -monoxide. Found patterns are known in organic chemistry as "Krasusky's rule".

Aim. We aimed to investigate the Krasusky's biography, his role in the study of α -oxides reactivity (ethylene oxide, epoxides) and applying of "Krasusky's rule" in current studies.

Materials and methods. Data comprising the applying of Krasusky's scientific achievements in the study of ethylene oxide reactions with nucleophilic reagents.

Results and discussion. According to the "Krasusky's rule", epoxide cycle is opened by the action of H_2O , NH_3 , HCN , H_2S , ROH , RSH , $RCOOH$, $RHal$ etc. in neutral or basic medium. The disclosure proceeds with cleavage of C–O bond with participation of carbon atom which is less substituted (or has less bulk substituent) in the presence of base. Reaction proceeds through a bimolecular nucleophilic substitution (S_N2) mechanism.

Conclusions. There are many current synthetic investigations in which the "Krasusky's rule" is used, for example, synthesis of nitrophenylsubstituted 1,3-thiazolin-2-thiones based on the ring disclosure reaction of ethylene oxide by the action of dithiocarbamates (И.В. Кулаков и др., ХГС, 2010, №4); synthesis of acyclic derivatives based on N-ethyl-N-(oxiran-2-ylmethyl)aniline (Э.Г. Месропян, ЖОрХ, 2010, Т. 46, вып. 9); transformation of N-R-N-(oxyran-2-ylmethyl)bicyclo[2.2.1]hept-5-ene-exo-2-yl methylamines (Л.И. Касьян, ЖОрХ, 2011, Т. 47, вып. 7). Interaction of alkyl (oxyran-2-ylmethyl)malonic esters with aromatic dithiols follows Krasusky's rule and results in new sulfur-containing butyrolactones (Э.Г. Месропян и др., ЖОрХ, 2012, Т. 48, вып. 3).