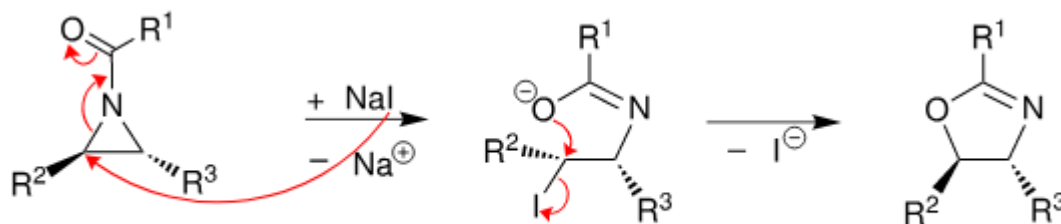


how can I know the major product in Heine reaction?

Solution. Heine reaction is characterized by the following equation:



The main product of an organic reaction, in general, is the product that will be most stabilized from energy and conformational points of view, that is, by steric (when the substituents do not repel each other) factors and by energy (when energy is at a minimum) the molecule is condition when it can be isolated in the resulting form and exist under normal conditions.

The Heine reaction shows that the nitrogen atom can have a bulky substituent, and also carbon atoms in the cycle can have bulky substituents. Methyl, ethyl, phenyl, etc. radicals may be included as bulky substituents. In the course of the Heine reaction, a cycle is opened, with an obligatory inversion at the carbon atom that is attacked by the nucleophile (in this case, the iodine anion), at the moment of the reaction. The attack of the nucleophile is on the one hand. Since the reaction mechanism has the character $\text{S}_{\text{N}}2$ -reaction, then it is carried out in a polar aprotic solvent.

As can be seen from the above reaction mechanism, the Heine reaction is an isomerization reaction; and the main reaction product will be determined precisely by this reaction.

Answer: the main product of the Heine reaction is determined by the reaction equation:

