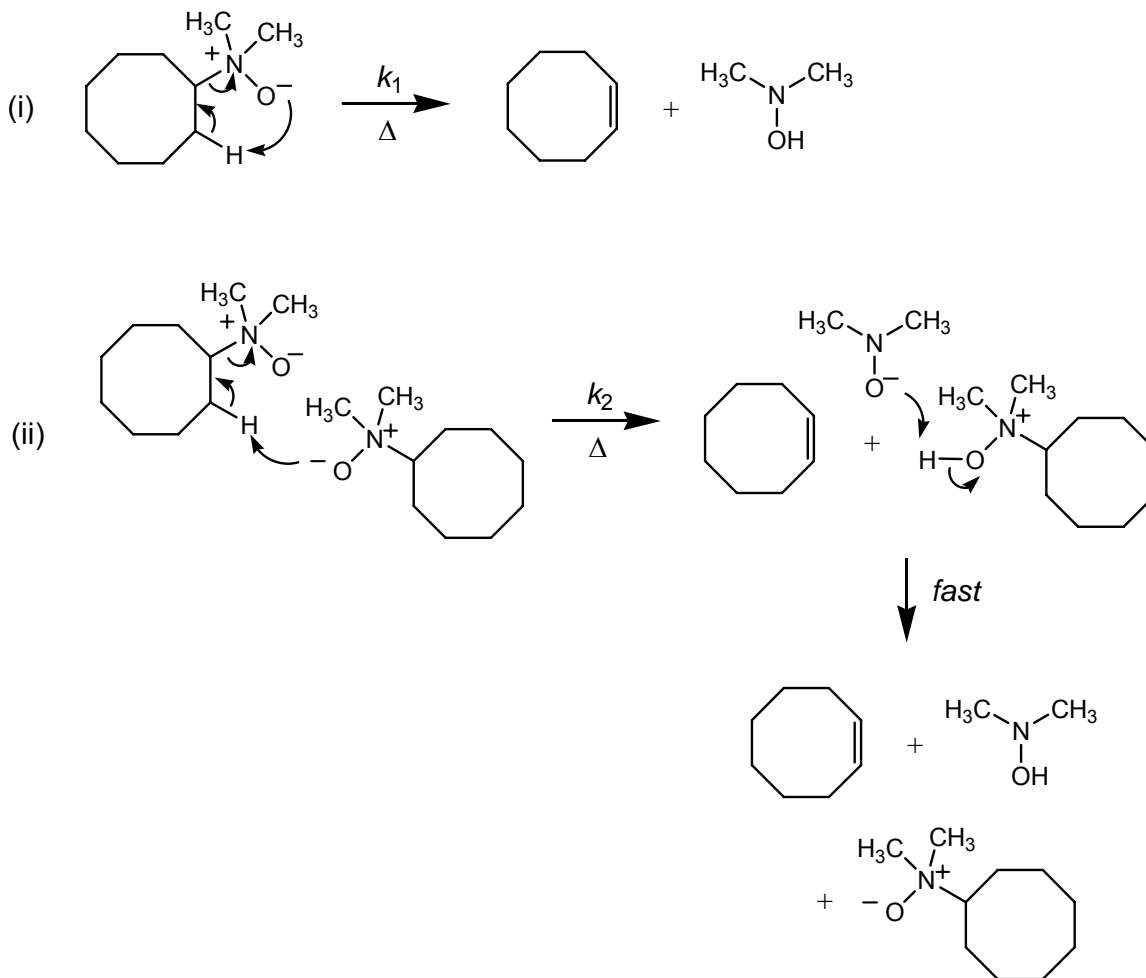


Workshop 5

At high temperatures, alkyl amine oxides will undergo Cope elimination to provide alkenes and free hydroxylamines. In principle, this elimination could proceed by an intramolecular (i) or intermolecular (ii) mechanism. For this problem, assume that both mechanisms occur simultaneously with rate constants k_1 and k_2 .



For this pair of reactions, write a single rate expression for $-\partial[\mathbf{A}]/\partial t = \text{rate}_1 + \text{rate}_2$ that combines these steps, and then write an integrated rate law that describes $[\mathbf{A}]_t$ in terms of t , k_1 and k_2 . Write your final answer in the form “ $[\mathbf{A}]_t = \dots$ ” It may help you to use the following standard integral:

$$\int \frac{dx}{x(a+bx)} = -\frac{1}{a} \ln \frac{a+bx}{x}$$