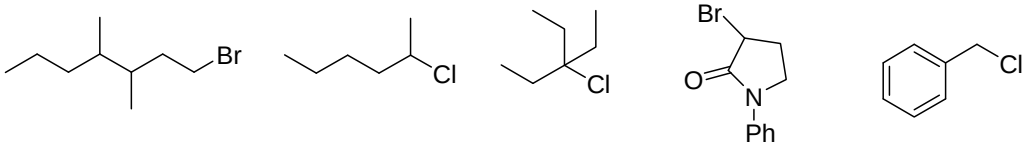
Organic Tutorial-3

Nucleophilic Substitution Reactions

Q. Rank the following nucleophiles in the order of decreasing nucleophilicity

CH_3COO^-, HO^-, $CH_3CH_2S^-$, EtOH, PhO^-, EtO^-

Q. Predict the mechanism (S_N1 and/or S_N2) for the solvolysis of following substrates in aqueous ethanol.



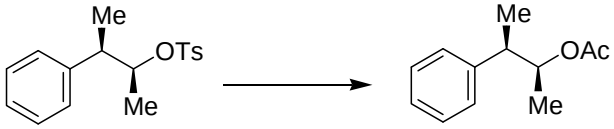
Q.

P **Q**

(i) Which compound solvolyses in AcOH faster?

(ii) If **P** is an optically pure one, will the solvolysed product be optically active? Justify your answer.

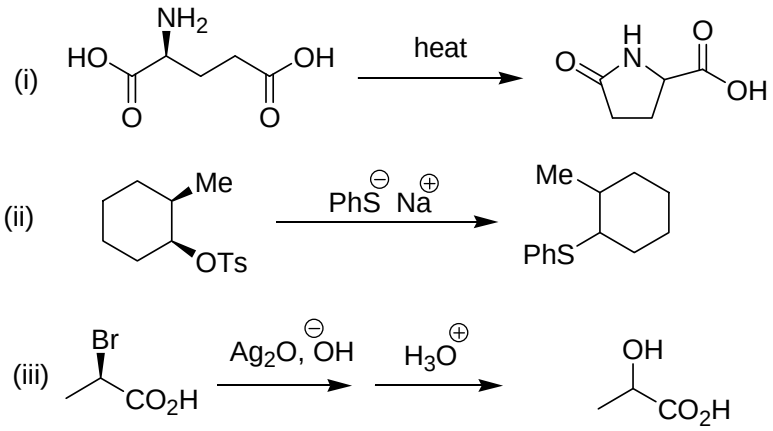
Q. Solvolysis of the enantiomerically pure compound **X** in AcOH gives racemic mixture of compound **Y**. Explain



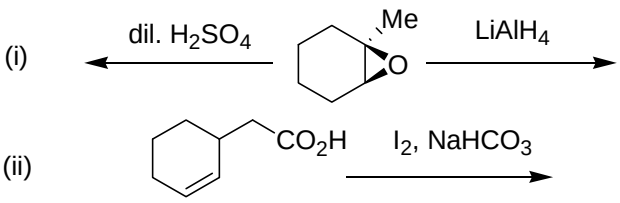
X **Y**

Optically pure (±)

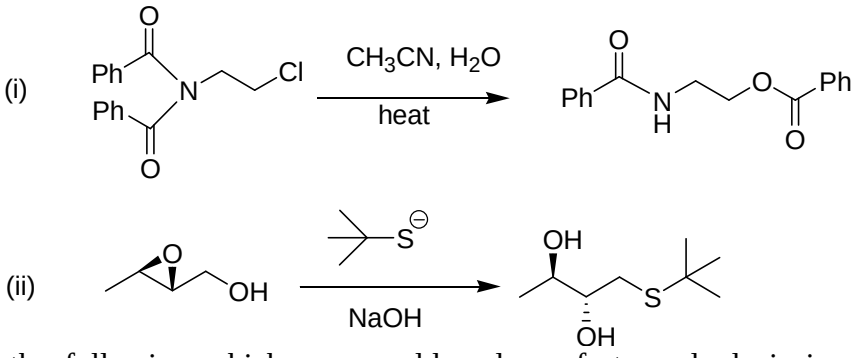
Q. Predict the stereochemistry of the products of the following reactions of enantiomerically pure starting compounds.



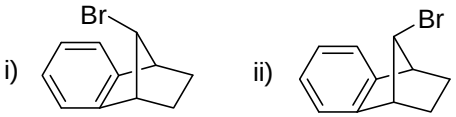
Q. Predict the product(s) with stereochemistry of the following reactions



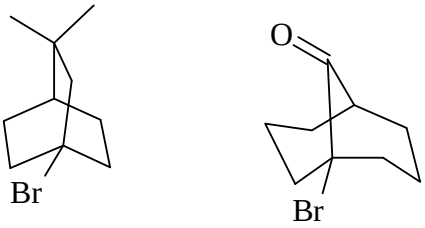
Q. Propose mechanism for the following reactions.



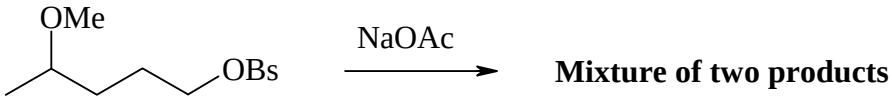
Q. Among the following which one would undergo faster solvolysis in acetic acid? Predict the products and justify your answer.



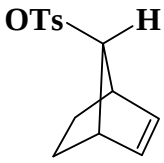
Q. The following two substrates are inert towards SN^2 reaction, Explain?

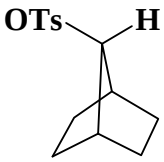


Q. In the following reaction two products are obtained, write down their structure with mechanism?



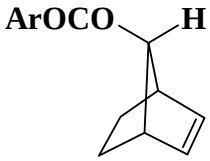
Q. Explain the rate of acetolysis of the following two substrates?

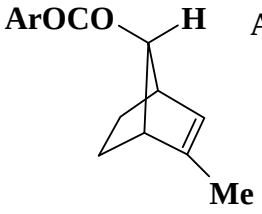


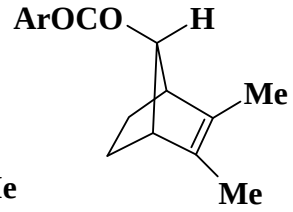


Relative rate **10^{11}** **1**

Q. Explain the relative rate of acetolysis of the following substrates?

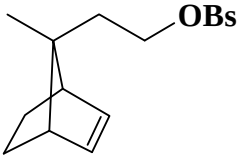


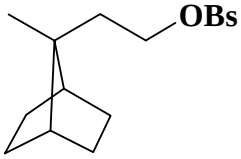




1 **13.3** **148**

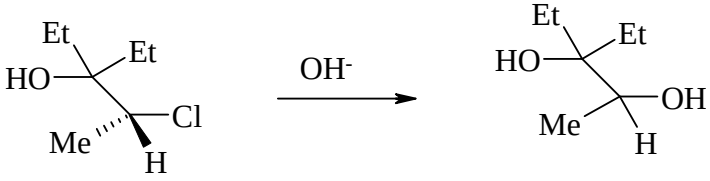
Q. Explain the relative rate of acetolysis of the following two substrates?





140,000 **1**

Q. Predict the stereochemistry of the final product with proper reasoning?



(R)