

SN1, SN2, E1, & E2 Reaction Mechanism Made Easy!

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{youtube}MrzUZSETgFc{/youtube}

This video shows you an easy way to identify if a reaction will undergo an SN1, SN2, E1, or E2 mechanism. SN1 reactions generate a racemic mixture of stereoisomers due to the planar structure of its carbocation. Both SN1 and E1 reactions can rearrange by means of a hydride shift or a methyl shift due to the formation of carbocation intermediate. There are no rearrangements for an SN2 and E2 reaction mechanism. Those reactions are concerted meaning they occur simultaneously in 1 step. SN2 reactions proceed with inversion of stereochemistry and E2 reactions proceed via an anti-coplanar transition state which means that the hydrogen that you remove must be opposite to the bromine before you can create an alkene. SN2 reactions prefer methyl & primary substrates. SN1 & E1 reactions prefer secondary and tertiary substrates. E2 requires the use of a strong base. Polar Protic Solvents favor SN1/E1 reactions because they can stabilize the carbocation intermediate by solvation. They're not good for SN2 reactions because they solvate/stabilize the nucleophile which affects the rate of an SN2 reactions ($\text{Rate} = K[\text{Substrate}][\text{Nucleophile}]$). SN1 reactions are not affected by the concentration or strength of the nucleophile due to the equation $\text{Rate} = K[\text{Substrate}]$. Polar aprotic solvents work well for an SN2 reaction because they do not solvate the nucleophile allowing to react freely with the substrate. Crown ethers enhance the strength of the nucleophile because they solvate the cation such as K^+ allowing the nucleophile such as F^- to be free to react. I hope these extra notes help

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