

KKH Group meeting Friday 19th Januray: Diels-Alder and Cycloaddition reactions

Basic (Undergraduate level - must be able to answer perfectly!):

What is a transition state?

Definition of ΔG^0 , ΔG^\ddagger , and their relationship with the reversibility of a reaction, leading to the formation of kinetic and thermodynamic products.

Draw transition states for the Diels-Alder (D/A) reaction between butadiene and ethylene. Include HOMO-LUMO interactions in your answer.

Intermediate (a little further):

Revise Hammond postulation of early and late transition states. Give an example of each. Discuss the application of this in D/A chemistry.

Address the stereochemical issues of the D/A reaction: syn vs anti, endo- vs exo-.

Advanced (Expanding your repertoire, to impress examiners):

Name one other type of cycloaddition reaction. Give an example and highlight stereochemical issues.

Literature:

Give an example of a chiral Lewis-acid catalysed Diels-Alder reaction. Stereoselectivity and/or application in synthesis preferred.