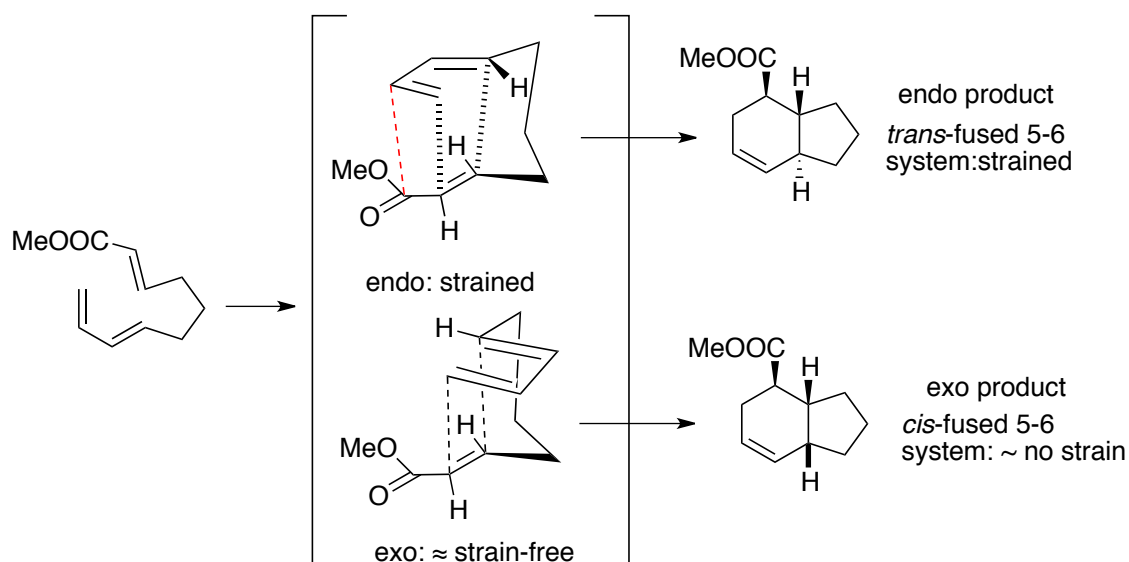


CHEM 330

Topics Discussed on Dec. 4

Kinetic aspects - II:

Principle: intramolecular Diels-Alder reactions that would form a strained product through an *endo*-topology tend to proceed slowly and yield significant amounts of the *exo* product. In such cases, Lewis acid catalysis accelerates the reaction and increases *endo*-selectivity to a substantial extent. Example:



Beneficial effect of Lewis acid catalysis on reaction rate and *endo*-selectivity:

- | | |
|---|--|
| • no Lewis acid catalyst: heat, slow | nearly 1 : 1 mixture of <i>endo</i> and <i>exo</i> products formed (nonselective reaction) |
| • with Et ₂ AlCl: room temp., fast | <i>endo</i> -product only |

Diels-Alder reactions (and pericyclic reactions in general) as powerful transformations for the construction of carbon architectures of the type found in molecules of biomedical interest, especially when combined with the reactions discussed earlier in the course

Massive volume of literature describing applications of the Diels Alder reaction to the synthesis of biologically relevant molecules