

ORGANIC NAMED REACTION ^{1.}

DEGREE-III (H) , PAPER-VII

DIEL'S-ALDER REACTION CONTINUED...

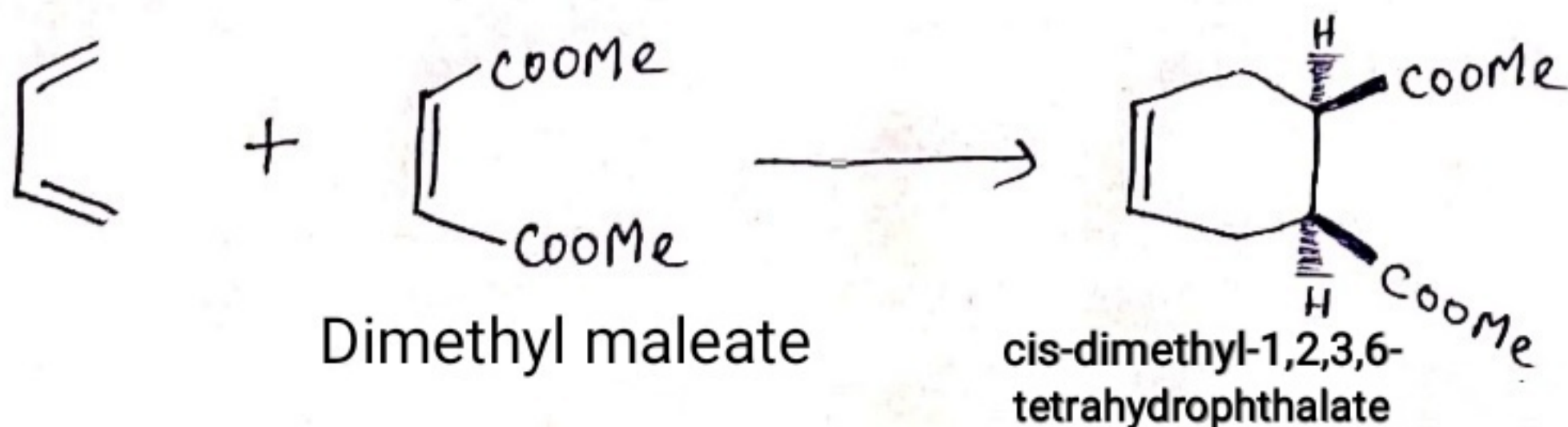
LECTURE-6 , DATE :18/09/2020

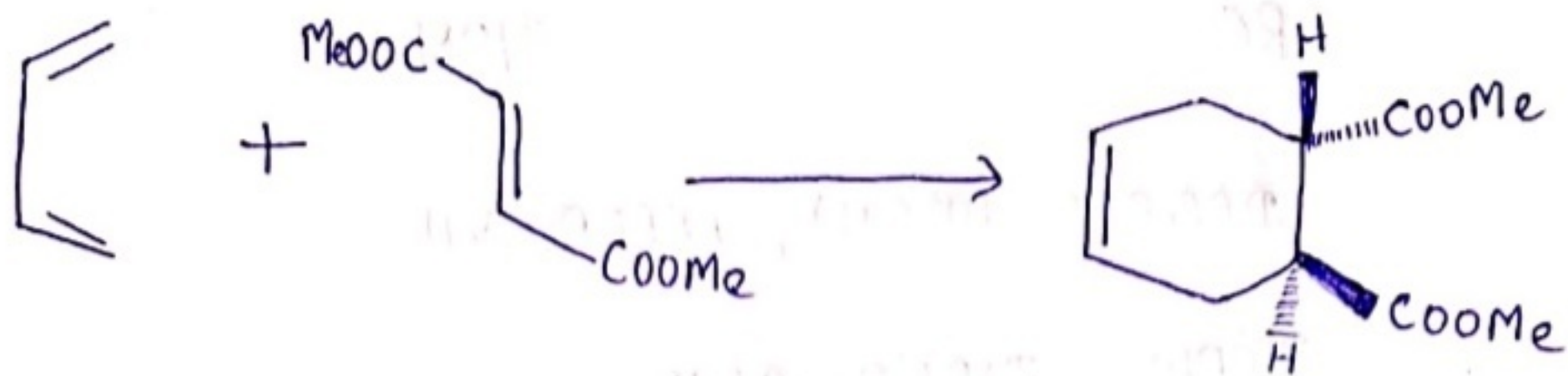
STEREOCHEMISTRY

* The reaction is highly stereospecific and used for the synthesis of a variety of adducts having different types of ring structures.

For example, dimethylmaleate (a cis dienophile) reacts with butadiene to give cis-dimethyl-1,2,3,6-tetrahydrophthalate.

However, dimethylfumarate (a trans dienophile) on reaction with butadiene gives corresponding trans product, trans-dimethyl-1,2,3,6-tetrahydrophthalate.

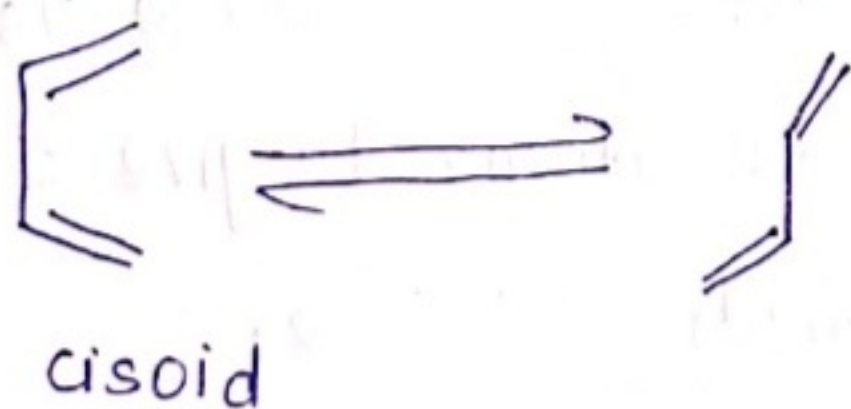




trans-dimethyl-1,2,3,6-tetrahydrophthalate

* Dienes can exist in a cisoid and a transoid conformation and only the cisoid form undergoes this reaction.

If the diene is locked into the transoid conformation, the reaction does not take place.



e.g. (This conformation does not give Diels-Alder Reaction)

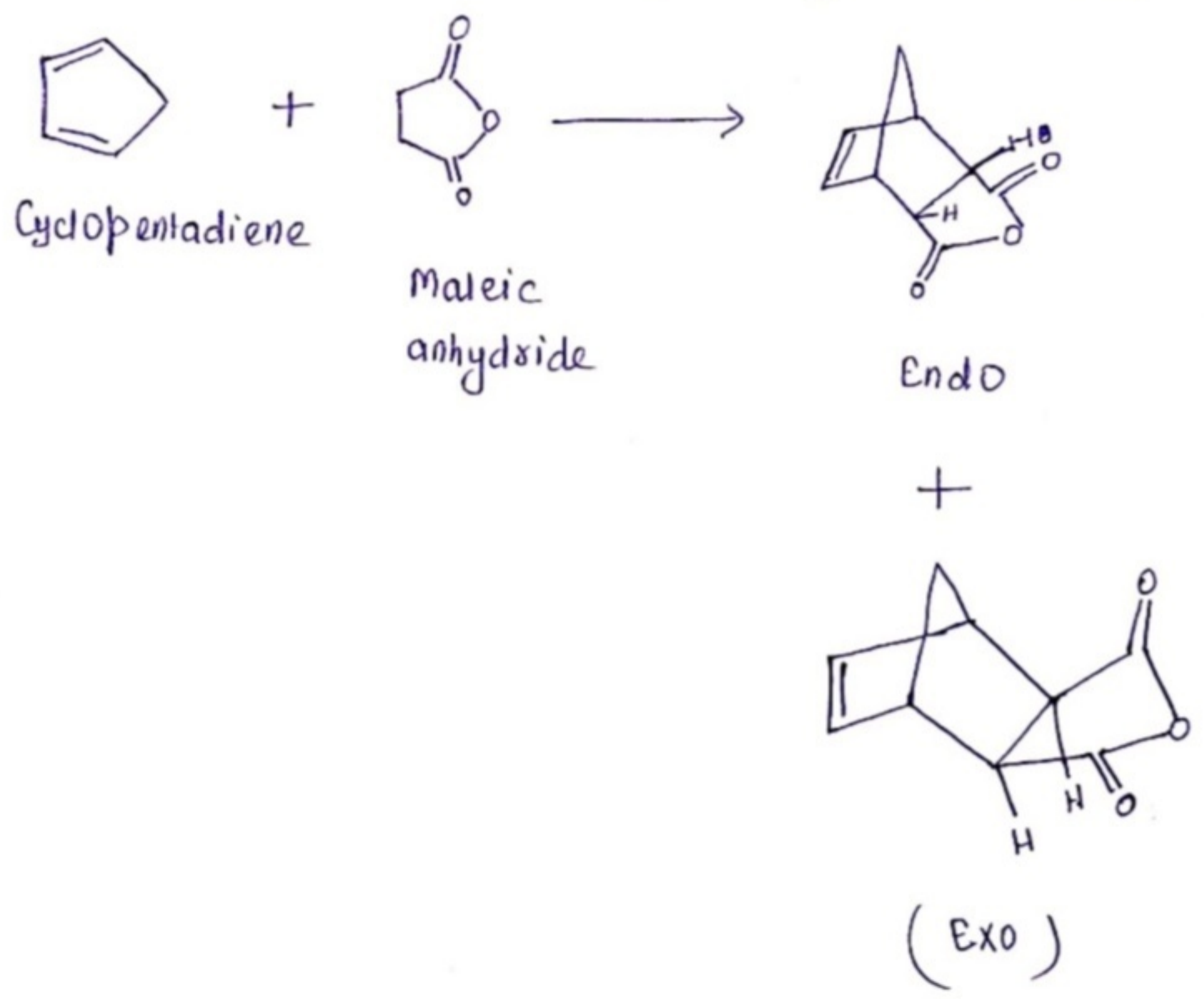
* The reaction of cyclopentadiene with maleic anhydride may form a product with two orientations i.e.; endo or exo.

In this case and most other cases the thermodynamically less stable endo product

predominates and thermodynamically more stable exo product is formed in 1-2% yield.

However, reaction of furan with maleimide leads to a thermodynamically more stable exo product.

In this case the initially formed kinetically favoured endo product dissociates at moderate temp. and more stable exo product gradually accumulates.



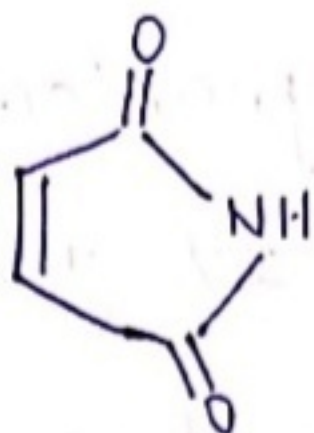
4.



Furan

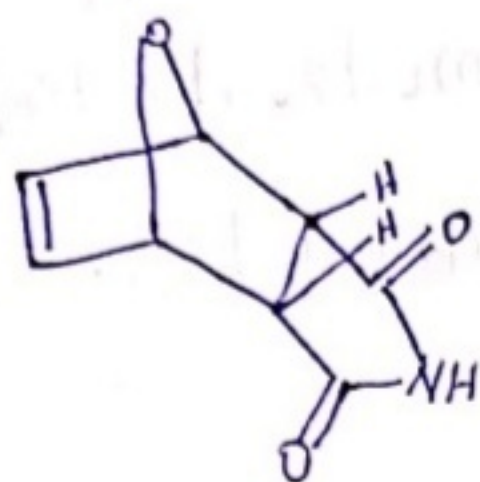
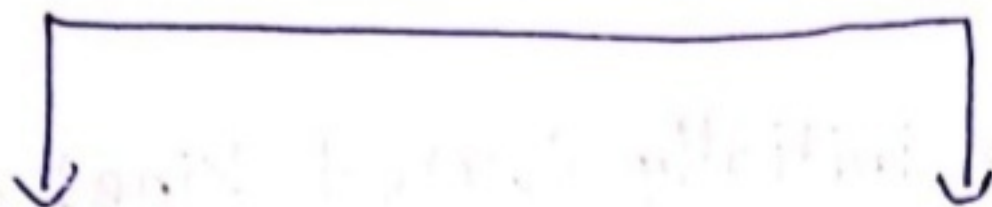
25°

+

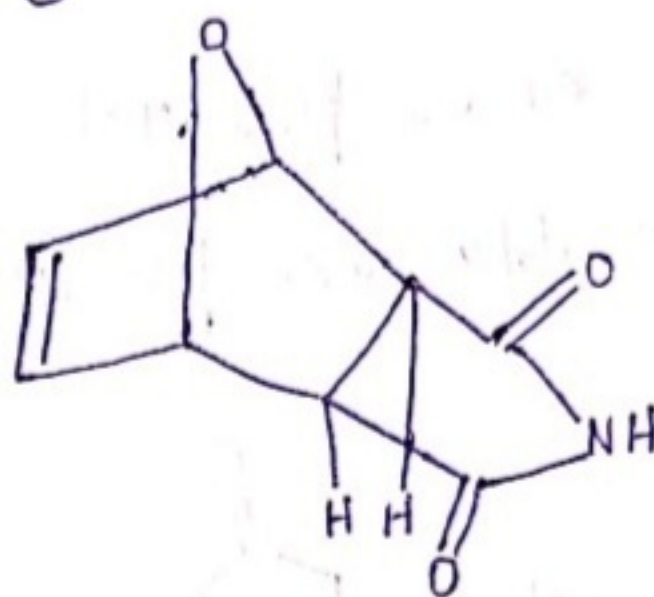
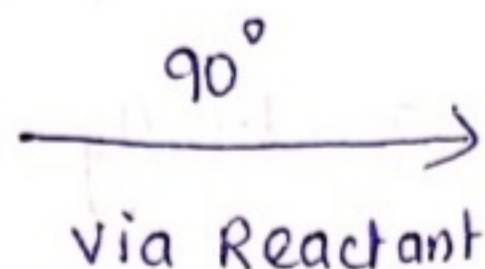


Maleimide

90°



(Endo)



EXO

To be continued in next lecture..

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