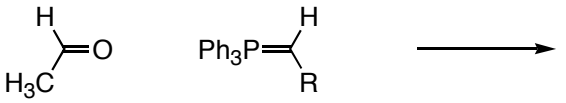
The Wittig Reaction:
Aldehydes

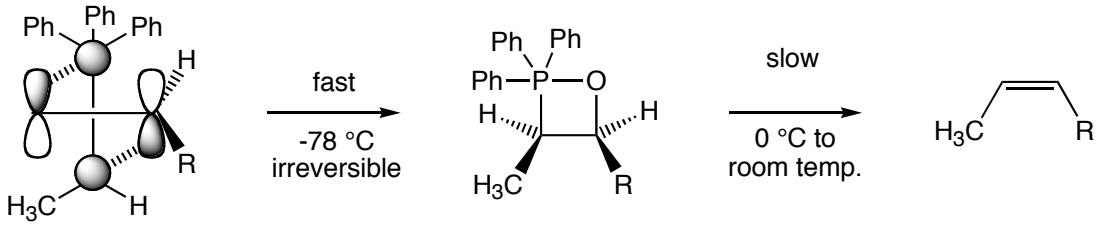


- metathesis reaction
- predominantly cis products (> 90 %)
- as R gets larger cis prod. increases

currently accepted mechanism :

π^2a + π^2s cycloaddition

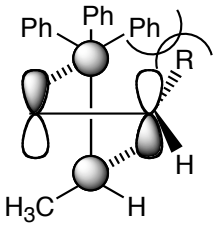
antarafacial suprafacial



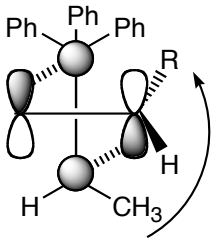
orientation is so that R and CH_3 are as far apart as possible

J. Am. Chem. Soc. **1973**, *95*, 5778.

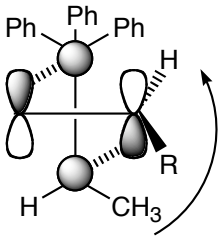
Alternative 2 + 2 transition states



steric interaction between R and Ph



steric interaction between R and CH_3

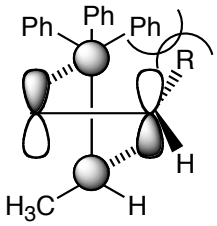


steric interaction between H and CH_3

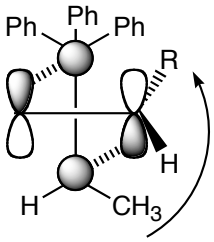
- may lead to trans prod

Olefin Synthesis
The Wittig Reaction

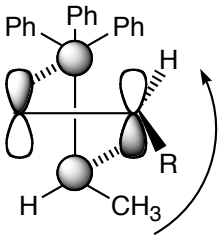
Alternative 2 + 2 transition states



steric interaction between
R and Ph



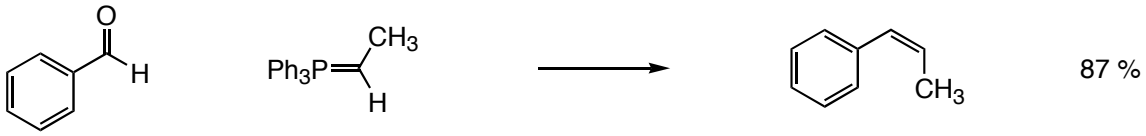
steric interaction between
R and CH_3



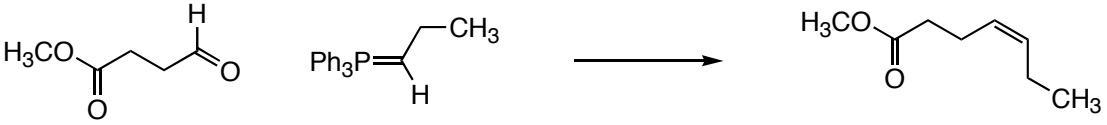
steric interaction between
H and CH_3

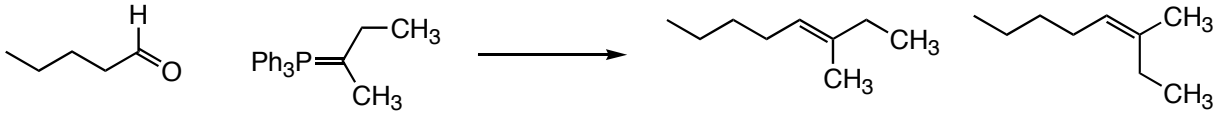
• may lead to trans prod

Examples



87 %





1 : 1 ratio of products
little difference in T.S.

Olefin Synthesis
The Wittig Reaction

stabilized ylides (cont.)

• Addition of ylide to aldehyde is reversible and slow