The Wittig Reaction: Mechanism and stereochemistry

$$Ph_3P \rightleftharpoons$$

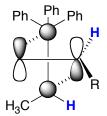


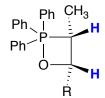
- · metathesis reaction
- predominantly cis products (> 90 %)as R gets larger cis prod. increases

currently accepted mechanism:

$$\pi^2 a$$
 + $\pi^2 s$ cycloaddition antarafacial suprafacial

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



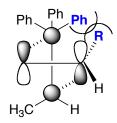


LOWEST ENERGY TS

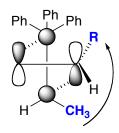
orientation is so that R and CH₃ are as far apart as possible

cis-oxaphosphetane

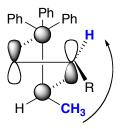
Alternative 2 + 2 transition states



steric interaction between R and Ph



steric interaction between R and CH₃



steric interaction between H and CH₃

· may lead to trans prod