The Wittig Reaction: Mechanism and stereochemistry

\[ \pi^2 \text{a} + \pi^2 \text{s} \]

currently accepted mechanism:

\[ \text{antarafacial} \quad \text{suprafacial} \]

\[ J. \text{Am. Chem. Soc.} \; 1973, \; 95, \; 5778. \]

LOWEST ENERGY TS

orientation is so that R and CH\(_3\) are as far apart as possible

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

metathesis reaction

• predominantly cis products (> 90 %)

as R gets larger cis prod. increases

fast

-78 °C irreversible

slow

0 °C to room temp.

cis-oxaphosphetane