

CHEMISTRY 130 BL QUIZ 2 (Wittig-Reaction)
Fall 1998 (10-19-98)

Fill out the following information completely or you will lose 5 points. Please indicate who your TA is or in which section you are. It would be also nice if you could write legible. You have 10 minutes to complete the quiz. Good luck.

First letter of your last name:

Full Name:

UCLA I.D.#:

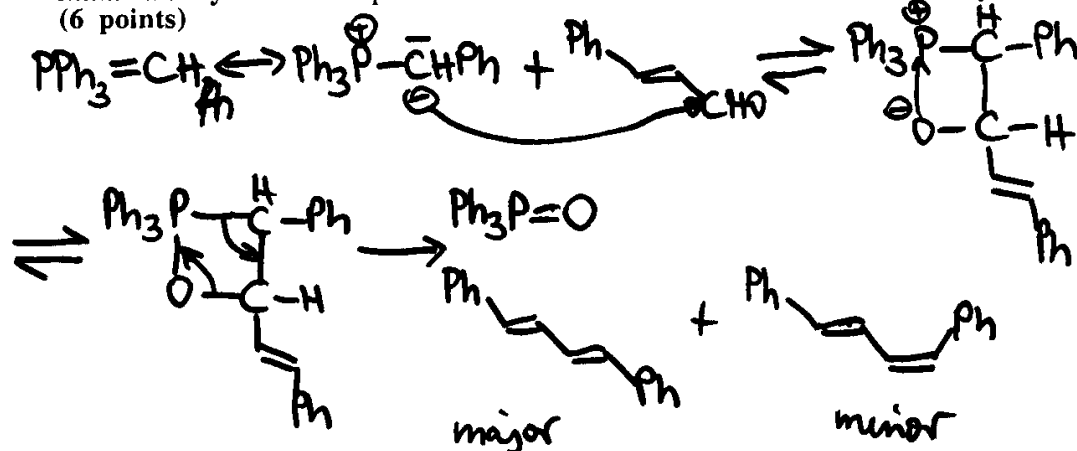
Section/TA: Zhe Joe Thach

Alf

1. The methylene group in benzyltriphenylphosphonium chloride (Wittig salt) appears as a doublet at $\delta=5.5$ ppm. Explain briefly. (2 points)

- doublet because of coupling with ^{31}P ($I=1/2$)
- chemical shift mainly due to positive charge on P

2. Outline the mechanism for the formation of the final product starting from the ylid and cinnamaldehyde. Show all products of the reaction and the correct stereochemistry! (6 points)



3. Which color does

a) the ylid

yellow

b) the major product

white

c) the minor product have? (3 points)

yellowish

4. What are the health hazards of benzylchloride and triphenylphosphin? (3 points)

Benzylchloride: lachrymator (tear-causing),
 skin irritant

Triphenylphosphin: toxic!

5. How can you distinguish between the major and the minor product by

a) IR spectroscopy (2 points)

trans,trans: copending at $\sim 960\text{cm}^{-1}$

trans,cis: copending at $\sim 960\text{cm}^{-1}$ and 730cm^{-1}

b) H-NMR spectroscopy (2 points)

trans,trans: two signals for alkene H, $J \approx 16\text{Hz}$

trans,cis: four signals for alkene H, $J_t \approx 16\text{Hz}$, $J_c \approx 8\text{Hz}$

c) C-NMR spectroscopy (2 points)

trans,trans: symmetry, 6 signals

trans,cis: no symmetry, 12 signals

d) physical properties (2 points)

t,t: mp = 152°C | different R_f values | solubility in EtOH

t,c: oil at r.t. | $R_f(t,c) > R_f(t,t)$

6. Predict the products of the following reactions including the correct stereochemistry (6 points).

