

Q: Why does hamburger have lower energy than steak?
 A: Because it's in the ground state.

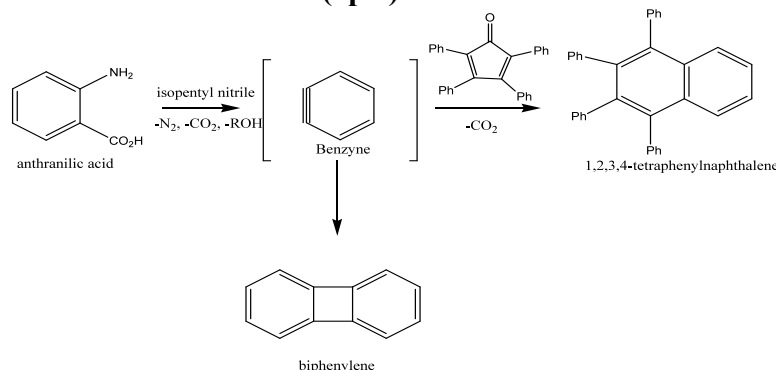
NAME: Answer Key

TA: Robert

Section: 1E

Quiz #5

1. Complete the reaction scheme for today's experiment. (6pts) What is the intermediate structure called? (2pts)



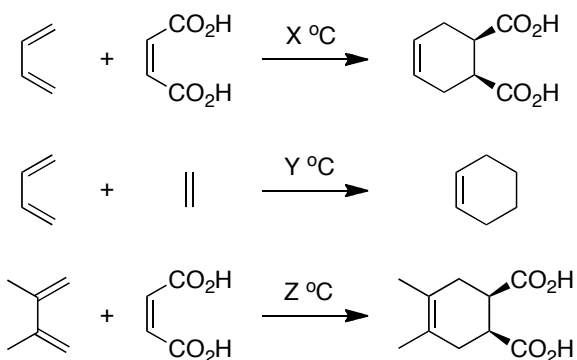
2. Why are we using the quartz cuvet and not a plastic/glass cuvet today? (2pts)

We are taking a UV-VIS spectrum from 200-700 nm. 1,2,3,4-tetraphenylnaphthalene does not absorb in the visible spectrum, but below 300 nm. Plastic and glass cuvetts will absorb in this range and ruin the sampling. Quartz cuvetts do not absorb in the range we are looking for.

3. Why shouldn't you inhale isopentyl nitrite? (2pts)

Isopentyl nitrite is a heart stimulant. If you are sensitive to heart stimulants, or get a big whiff of it, adverse affects will occur.

4. Based on your knowledge of dienes and dienophiles, rank the following reactions in order of temperature needed to induce a reaction. (3 = lowest temp, 1 = highest temp). (3pts) Explain your reasoning. (4pts)



2, 1, 3. The more electron-donating groups that are on the diene, and the more electron-withdrawing groups that are on the dienophiles, will lower the activation energy in the system, requiring a lower heat. Electron-donating groups raise the HOMO-LUMO gap of the diene and electron-withdrawing groups lower the HOMO-LUMO gap of the dienophiles, thus a bonding orbital is more easily formed. For

representations, please see the reader.

5. If a student observes an absorbance of 0.754 a.u. at 450 nm, and the concentration of the sample is 3.0×10^{-4} M, what is the molar extinction coefficient at that wavelength? (1pt)

$$A = \epsilon lc \quad 0.754 = \epsilon (1)(0.0003) \quad \epsilon = 2513$$