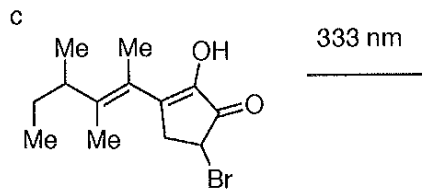
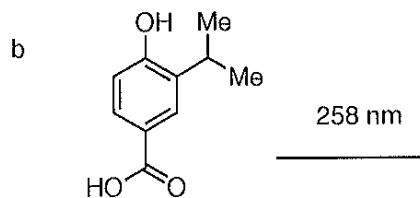


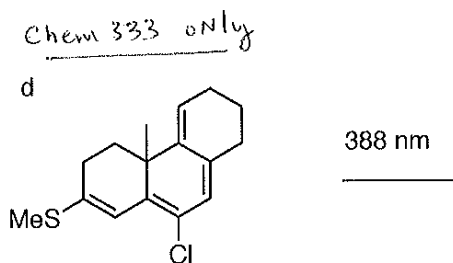
heterodiene base:	214
double bond extension:	30
alkyl or ring (4 x 5):	20
exocyclic double bond (2 x 5):	10
OAlkyl	6
NMe2	60
	<hr/>
	340



5-membered ketone base:	202
double bond extension:	30
β-alkyl group (1 x 12):	12
γ or higher alkyl (3 x 18):	54
α-OH group:	35
	<hr/>
	333

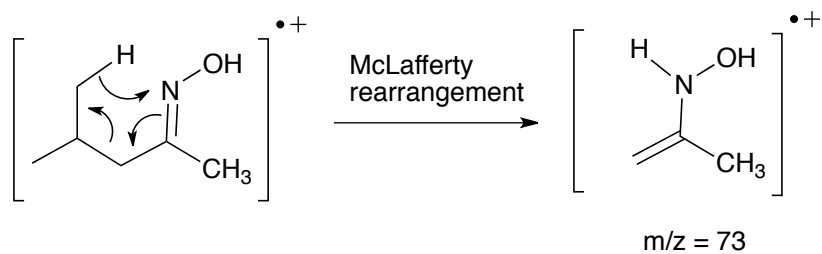
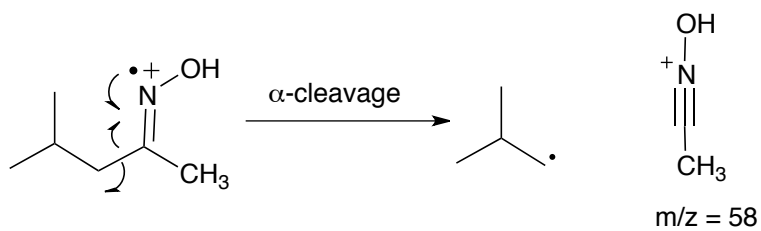
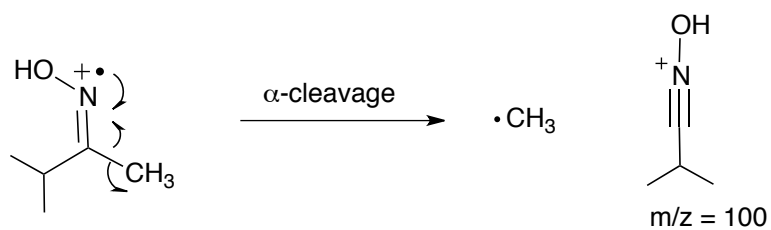
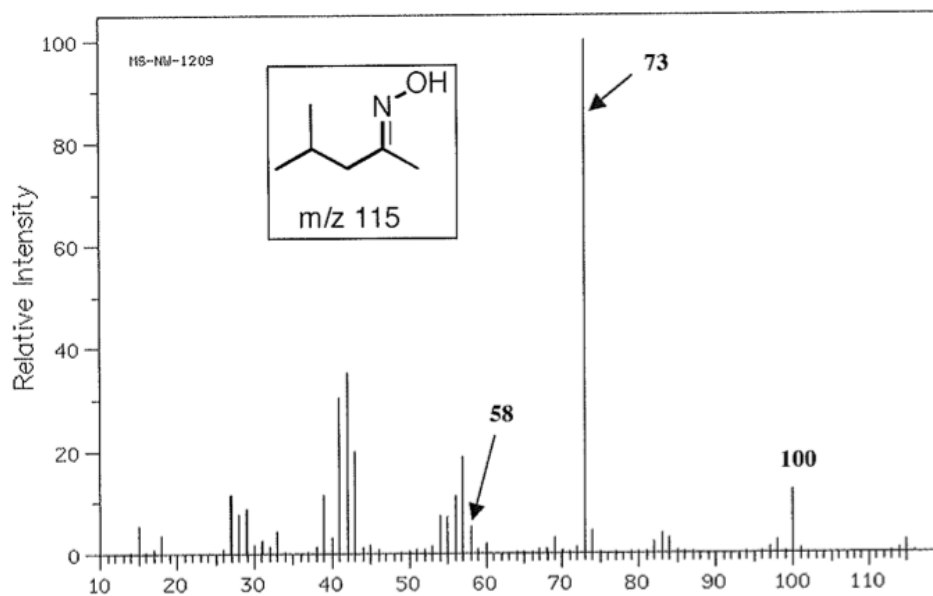


benzoic acid base:	230
m-alkyl:	3
p-OH:	25
	<hr/>
	258

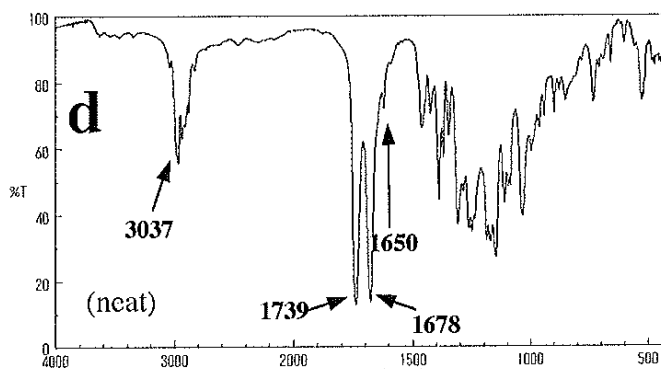
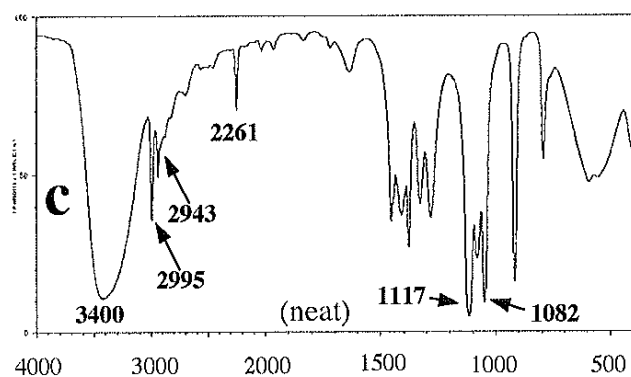
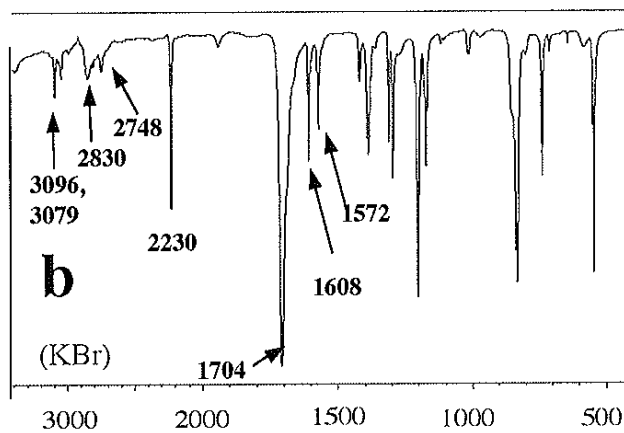
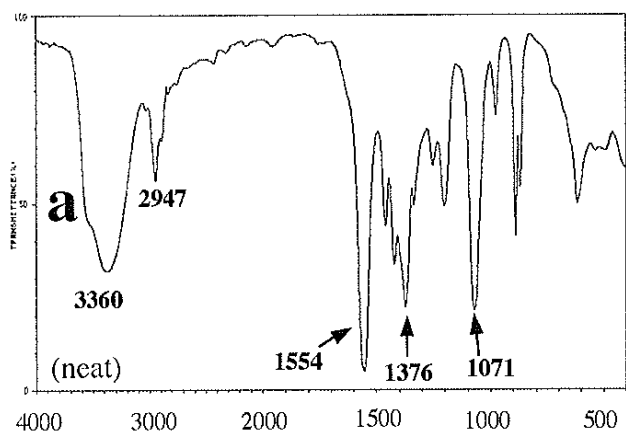
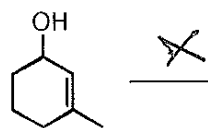
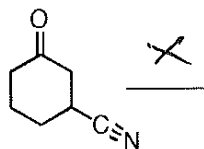
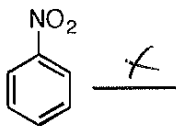
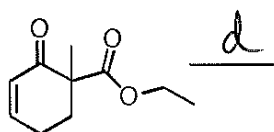
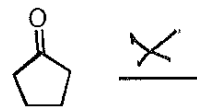
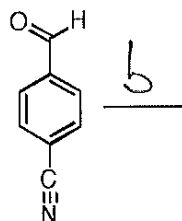
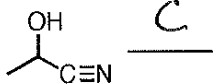
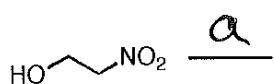


homodiene base:	253
double bond extensions (2 x 30):	60
alkyl or ring (5 x 5):	25
exocyclic double bond (3 x 5):	15
SAlkyl:	30
Cl:	5
	<hr/>
	388

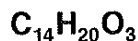
2. Explain how the labeled fragments are formed. (12 points)



3. Match the following to their IR spectra. Note, only 4 spectra have a match. Place an X next to those compounds that do not have a match. 20 points total



4. Elucidate the following structure based on the spectral data



1H NMR

6.90 (d, $J = 2.1$ Hz, 1H)
 6.76 (d, $J = 7.9$ Hz, 1H)
 6.68 (dd, $J = 7.9, 2.1$ Hz, 1H)
 3.83 (s, 3H)
 3.80 (s, 3H)
 3.34 (s, 2H)
 2.22-2.10 (d, $J = 6.9$ Hz, 2H)
 2.06 (m, 1H)
 0.91 (d, $J = 6.3$ Hz, 6H)

^{13}C NMR

207, s
 151, s
 150, s
 128, s
 122, d
 114, d
 113, d
 56, q
 55, q
 52, t
 50, t
 25, d
 23, q (2 carbons)

IR (neat, cm^{-1})

3051, 2956,
 1713, 1592,
 1515, 1260,
 1237

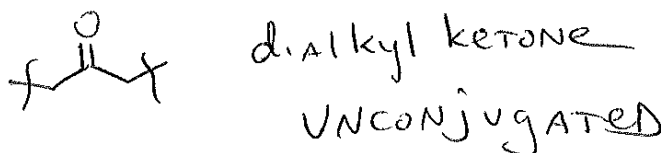
MS: 236 (M^+ , parent peak),
 194, 179, 151, 85

a) Calculate the IHD: 5 (1 point)

b) Show the substructure that is associated with the following IR peak (6 points)

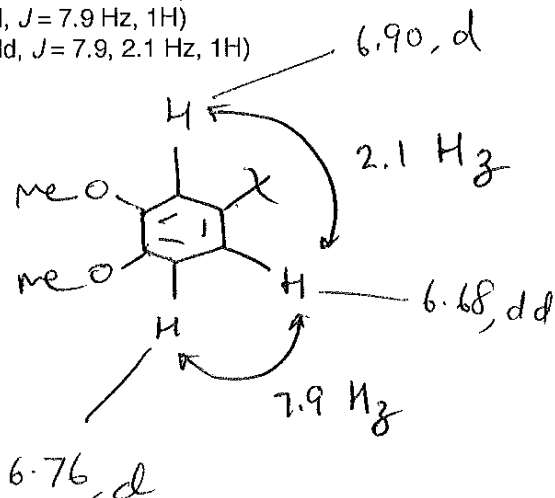
1713 cm^{-1}

NOTE: For questions about IR spectroscopy, be sure to indicate if the peaks tell you any information about ring size, conjugation, lack of conjugation etc.



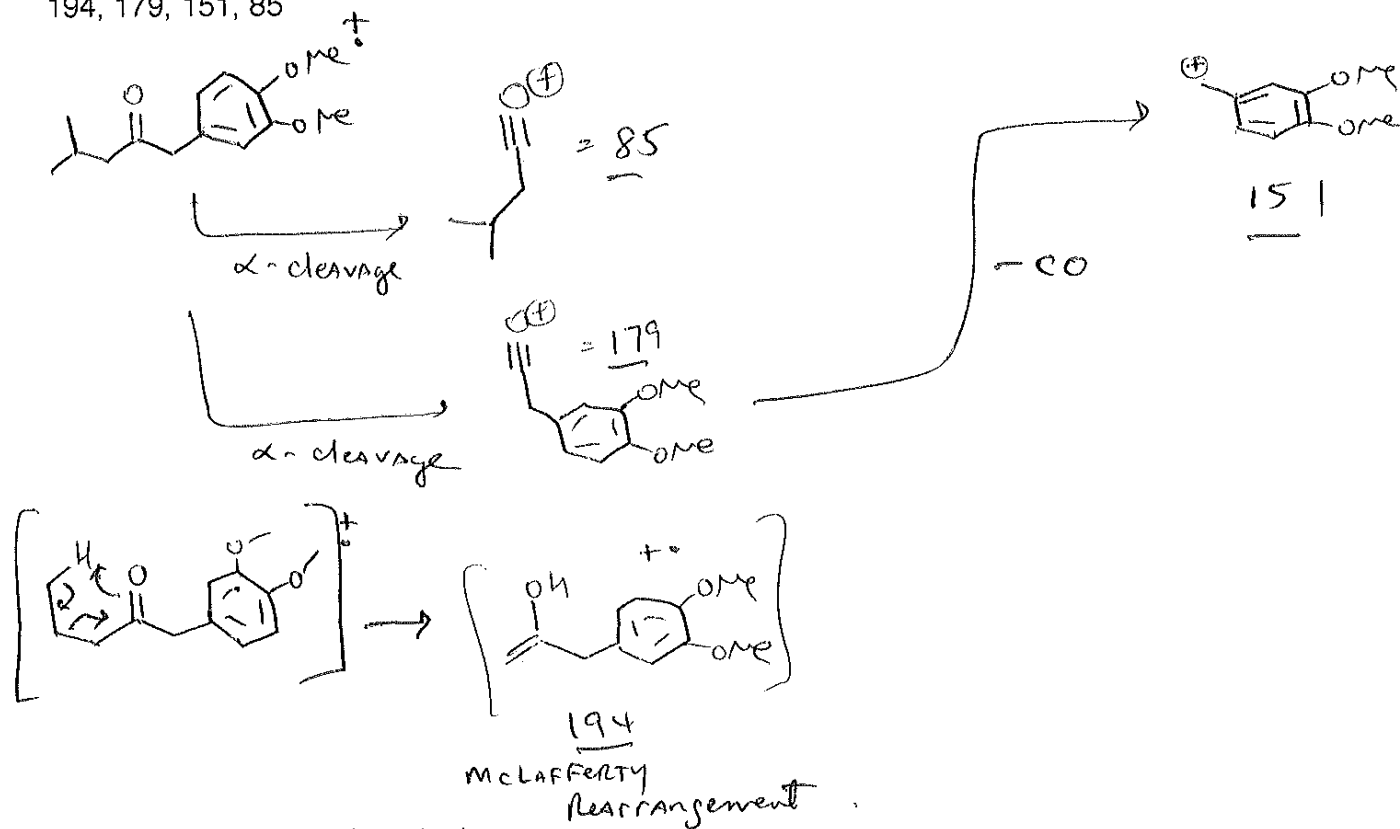
c) Show the substructure that is associated with the following 1H NMR resonances. Assign the coupling constants (10 points).

6.90 (d, $J = 2.1$ Hz, 1H)
 6.76 (d, $J = 7.9$ Hz, 1H)
 6.68 (dd, $J = 7.9, 2.1$ Hz, 1H)



d) Assign the following mass spectral fragments (8 points)

194, 179, 151, 85



f) Show your final structure (12 points)

