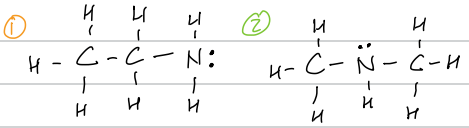
Trevor Swan

Ch1 HW - 1-34 c, 1-39, 1-41i, d, c, k, l, 1-42 b, h, i, 1-44, 1-46, h, j, 1-52 a, f, 1-54d, 1-55d, e. 1-58 a, b, f, 1-59 c, f

1-34 c) two lewis for C_2H_7N



C: F.C = 4 − ½(8) = 0 N: F.C = 5 − ½(6) − 2 = 0

Is there a reliable way to predict EN differences?

1-39 a) C–Cl large (2.5) b) C–H small

c) C–Li large d) C–N small

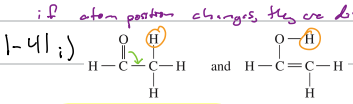
e) C–O large f) C–B large

g) C–Mg large h) N–H large

i) O–H large j) C–Br small

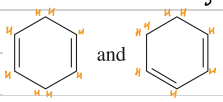
if atom position changes, they are different compounds!

1-41 i)



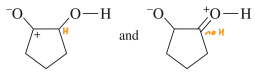
Different Compounds, H moved position

d)



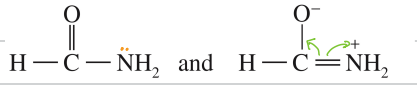
H changed position, different compounds

c)



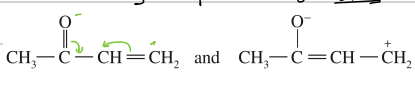
Missing H on a Carbon, different compounds

k)



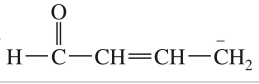
Resonance, e^- position changed only

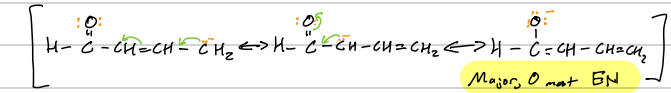
l)



Resonance, e^- position changed only

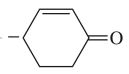
1-42 b)

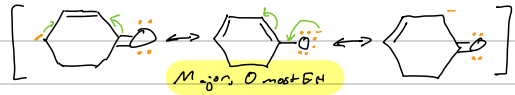




Major, O most EN

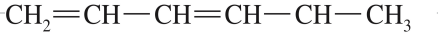
h)

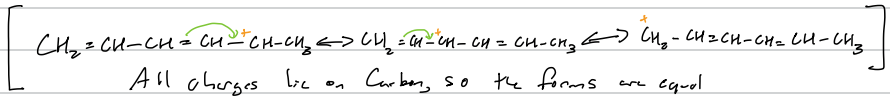




Major, O most EN

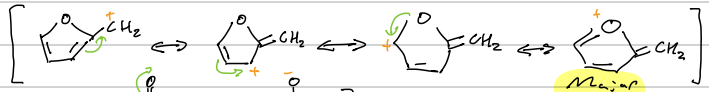
i)





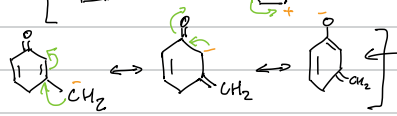
All charges lie on Carbon, so the forms are equal

1-44 a)



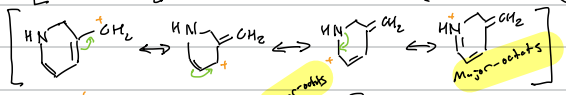
Major

b)



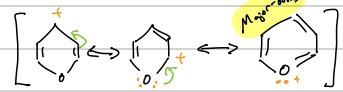
Major, all octets filled and O has neg while being most EN

c)



Major octets

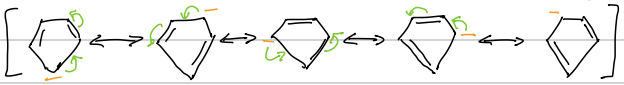
d)



Major adds

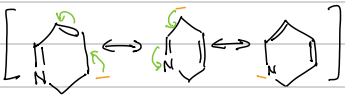
The first and second resonance forms can be mirrored, should these be written

e)

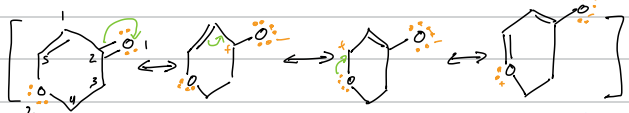


All equal

f)

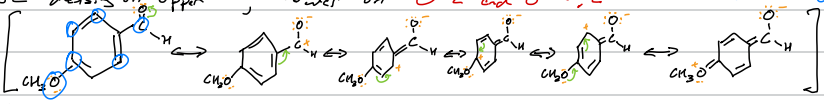


1-46 h)



higher – density on upper O-1, lower on O-2 and C-5, 2 ← how is this determined

j)



blue circles indicate areas of lower electron density

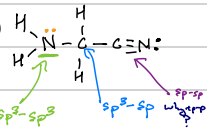
1-52 a) $[NH_2]^-$

i) H–N–H

ii) how?

iii) < 109°

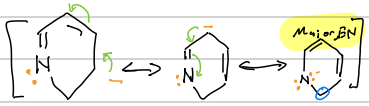
f) H_2N-CH_2-CN :)



ii) sp^3–sp^3, sp^3–sp, sp–sp

iii) N and C: 109° C and N: 180°

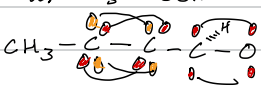
1-54 d)



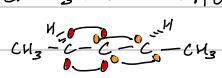
Major EN

Carbon is sp^3, but all other atoms are sp^2

1-55 d) $CH_3C\equiv CCHO$

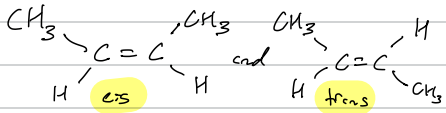


e) $CH_3CH=C=CHCH_3$



P: bond overlap, bonded orbitals are color coded

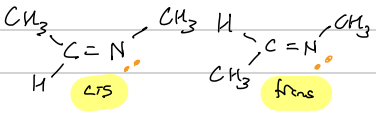
1-58 a) $CH_3CH=CHCH_3$

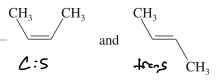


b) $CH_3-C\equiv C-CH_3$ no cis/trans

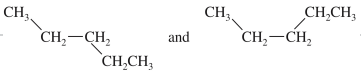
cannot even around a triple bond!

f) $CH_3-CH=N-CH_3$



1-59 a) 

These are cis/trans isomers

f) 

Same exact compound, free rotation