HOMEWORK ASSIGNMENT #4 ORGANIC CHEMISTRY II

**Alkyne roadmaps ; alkadiene electronic follies**

(due Monday 3 March)

**Your name :\_\_\_\_\_\_\_\_\_answers\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (21 points total)**

**4.1. Alkyne roadmaps (4 pts each/12 pts total)**

**a) Make propanoic acid starting from ethanol and ethyne :**







?

**Propanoic acid**

1. **Make 2-hexanone from 1-butene and ethyne:**





?



**2-hexanone**

1. **Make E-4-octene from 1-propanol and ethanol :**



**(hint: devise a path from ethanol to ethyne first)**





?

**E-4-octene**

E-only 4-octene

**4.2. alkadiene resonance behaviors**

a) Draw the possible carbocations formed when 2-methyl-1,3 butadiene is reacted with HBr in acetic acid assuming initial H+ attack produces a Markovnikoff addition (4 pts)



b) draw all the possible monobromination products from the above (2 pts)



A

C

D

B

1. based on thermodynamic stability , which product above is most likely ?

both C and D (resultant from resonance shifts)

d) based on the text’s comments about kinetic control (the pi electrons don’t move that

fast) which is the most likely product ? (2 pts)

**A**