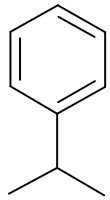
K	C	A	T
16		49	10

/75 = %

Name:_____

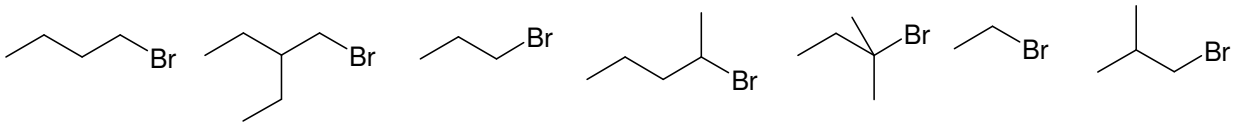
SCH 4U – Organic Chemistry Test #2

1. What is different about the "double bonds" found in an aromatic ring compound (example shown below), compared to a regular double bond. Use specific and detailed terminology. Use point form. How can the term delocalized be applied to an aromatic compound.



/5K

2. Organize the following structures (write the structures out in order)|in order of decreasing reactivity toward nucleophilic attack of the halogen. The "degree" of each alkyl bromide may be of interest in the is question. Write the degree of each halogen carbon under each structure



/6A

Name of property you have used:_____

Definition: _____ /4K

_____

Primary Factor:_____

Secondary Factor _____

K	C	A	T
9		6	

3. Which of the follow statements is true:

a) alcohols can be oxidized but only if they are third degree alcohols

b) in a oxidation in organic chemistry, oxygen is gained and/or hydrogen is lost

c) in order to oxidize alcohols, one must use a reducing agent such as $LiAlH_4$ in THF

d) oxidations seldom if ever accompany a corresponding reduction

e) alcohols cannot be oxidized because they have already lost electrons

4. For the property of steric hindrance:

a) the greater the steric hindrance, the more active the reactive site on the molecule

b) is never of concern in organic biological systems

c) depends more on length of blocking groups than the number of blocking groups (related to degree of reactive site)

d) is identical for all first degree alcohols

e) one must consider both the length and the number of side chains adjacent to a reactive site

5. Aromatic compounds:

a) undergo electronic resonance only at high temperatures

b) were never mentioned in this course

c) are not a part of normal biological systems

d) allow for the delocalization of **π** electrons (the pair of electrons that produces the second bond in a double bond)

e) are more reactive than corresponding alkenes

6. Sulphuric acid is used in many places in organic chemistry. Which of the following statements is true?

a) concentrated sulphuric acid at high temperature will **always** dehydrate an alcohol to form an alkene (there is a bonus mark for providing a counter example - use the margin)

b) cannot perform asymmetric additions on alkenes

c) is needed to reduce primary alcohols to ketones

d) is the acid of choice to put the flavour into french fries

e) it's function will depend on concentration and temperature

7. An asymmetric addition will occur whenever the following conditions are met:

a) 1-butene is treated with H_2 and Pt catalyst

b) 2-butanol is treated with concentrated H_2SO_4 at high temperature

c) 2-pentene is treated with H_2O and dilute catalytic quantities of H_2SO_4

d) 1-cyclohexene is treated with I_2 in water

e) 2-butene is treated with HCl in water

/10T

K	C	A	T
			10

8. Explain how the complete reaction sequence for the oxidation of a primary alcohol can be used to help remember other reactions in this unit. Show an example reaction sequence from any primary alcohol to final product (include the intermediate). Use clear points to reference this reaction to explain three other reactions.

/7K

K	C	A	T
7			

9. For the following monomers, write:

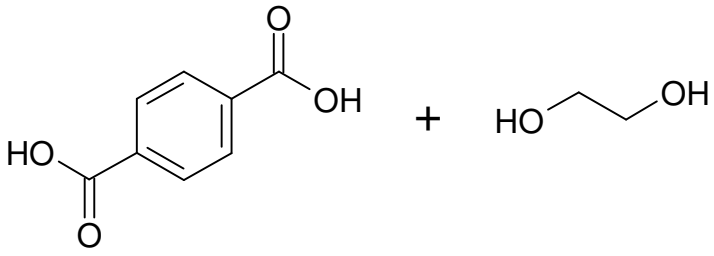
a) whether the monomer will undergo and addition of condensation polymerization

b) a polymer structure that is at least four monomer units long

c) necessary reaction condition for addition reactions

d) stable by-product for condensation reactions

It may be helpful to show all carbons and all hydrogens



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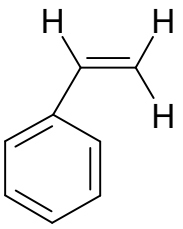

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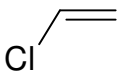
/4A

K	C	A	T
		8	



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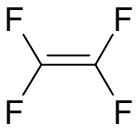

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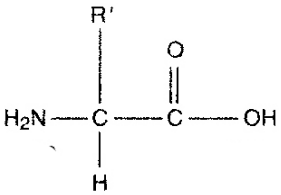

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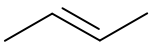
/4A

K	C	A	T
		12	

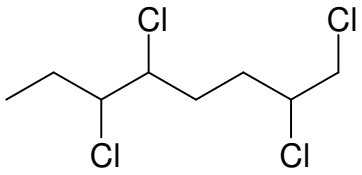
10. Complete each reaction sequence by providing reactants, product and condition under the reaction arrow as required in each problem:



$KMnO_4$
H_2O
(NaOH)

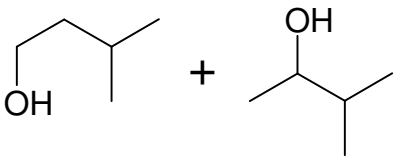
/1

Cl_2
H_2O

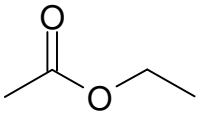


/1

H_2O
H_2SO_4
(cat)

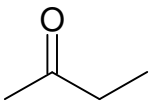


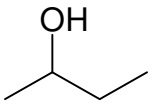
/1



H_2O
NaOH
(cat)

/2

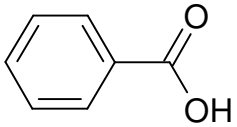




H_2SO_4
conc.
170 °C

/3

$KMnO_4$
H_2O
(NaOH)

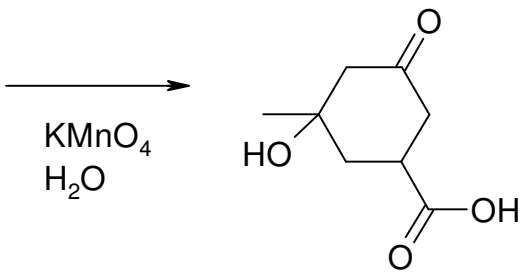


$LiAlH_4$
THF

/2

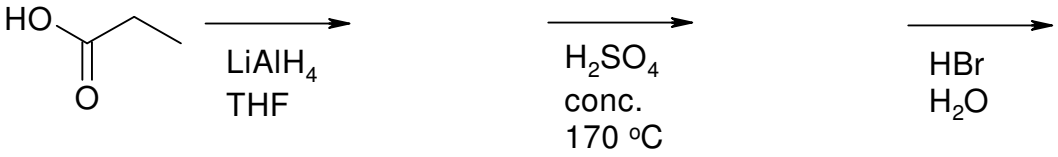
K	C	A	T
		10	

/3



/3

/3



/4

K	C	A	T
		13	