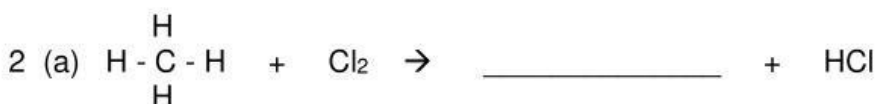


Organic Exercises

1. (a) Alkanes contain _____ carbon - carbon bonds and react (slowly) by _____.
- (b) Alkenes contain _____ carbon - carbon bonds and react by _____
- (c) Alkynes contain _____ carbon - carbon bonds and react by _____
- (d) To distinguish between alkene/alkyne and alkanes, I would add _____
- I would see _____



The addition of X_2 to $\text{C}=\text{C}$ or $\text{C}\equiv\text{C}$ is called _____.



The addition of H_2 to $\text{C}=\text{C}$ or $\text{C}\equiv\text{C}$ is called _____.



The addition of H_2O to $\text{C}=\text{C}$ or $\text{C}\equiv\text{C}$ is called _____



The addition of HX to $\text{C}=\text{C}$ and $\text{C}\equiv\text{C}$ is called _____



This process is called _____ / _____ / _____.

4. (a) How could you convert 2-butanol into an alkene? _____
- _____
- _____
- (b) Name and write the structural formula of the two possible alkenes produced.
- _____
- _____
- (c) Which one is the major product? _____

5. Name the alcohols and classify as 1^o, 2^o or 3^o :

(a) $\text{CH}_3 - \text{CH}_2 - \text{CH}_2 - \text{CH}_2\text{OH}$ _____ , _____

(b) $\text{CH}_3(\text{CH}_2)_4\text{CH}(\text{OH})\text{CH}_3$ _____ , _____

(c) $\begin{array}{c} - \text{C} - \\ | \\ - \text{C} - \text{C} - \text{C} - \\ | \\ \text{OH} \end{array}$ _____ , _____

6. (a) $- \text{C} - \text{C} - \text{OH}$ $\rightarrow$ _____ + H_2O

(b) $\begin{array}{c} - \text{C} - \text{C} - \text{C} - \\ | \\ \text{OH} \end{array}$ + _____ $\rightarrow$ $\begin{array}{c} - \text{C} - \text{C} - \text{C} - \\ | \\ \text{Cl} \end{array}$

(c) $- \text{C} - \text{C} - \text{OH}$ $\rightarrow$ _____ $\rightarrow$ _____

(d) $\begin{array}{c} - \text{C} - \text{C} - \text{C} - \\ | \\ \text{OH} \end{array}$ $\rightarrow$ _____

(e) The chemicals (oxidising agents) you would use to oxidise (d) and (e) above are either _____ or _____

(f) You cannot oxidise a 3^o alcohol because _____

7. (a) The functional group of a carboxylic acid is $\text{R} -$ _____.

(b) Organic bases are called _____ and have the general formula $\text{R} -$ _____.

8. (a) The characteristics of esters ($\text{R} - \text{COO} - \text{R}^*$) is their _____.

(b) $\begin{array}{c} \text{O} \\ || \\ \text{CH}_3 - \text{C} \\ | \\ \text{OH} \end{array}$ + $\text{HO} - \text{CH}_3$ $\rightarrow$ _____ + H_2O

(c) $\text{CH}_3\text{CH}_2\text{CH}_2\text{COOCH}_2\text{CH}_3$ is called _____ and is made from _____ and _____.

(d) $\begin{array}{c} \text{O} \\ || \\ \text{CH}_3\text{CH}_2\text{CH}_2\text{OC}(\text{CH}_2)_4\text{CH}_3 \end{array}$ is called _____ and is made from _____ and _____.

9. Use the word list below to classify the following molecules or types of reaction

addition cyclic substitution branched chain
saturated straight chain unsaturated

- (a) $C_5H_{12} + Br_2 \rightarrow C_5H_{11}Br + HBr$ _____
- (b) $CH_3CH_2CH_2CH_2CH_3$ _____
- (c) $CH_3CH=CHCH_3$ _____
- (d) $CH_3CH_2CH_2OH$ _____
- (e) $\begin{array}{c} CH_2 \\ CH_2 \quad CH_2 \\ CH_2 \quad CH_2 \\ CH_2 \end{array}$ _____
- (f) $CH_3CH=CH_2 + Cl_2 \rightarrow \begin{array}{c} CH_3CH-CH_2 \\ | \quad | \\ Cl \quad Cl \end{array}$ _____
- (g) $\begin{array}{c} CH_3 \\ | \\ CH_3-C-CH_2CH_3 \\ | \\ CH_3 \end{array}$ _____
- (h) $CH_2=CH_2 + HBr \rightarrow CH_3CH_2Br$ _____
- (i) $CH=CH$ _____
- (j) $CH_3CH(CH_3)CH_2CH_3$ _____

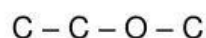
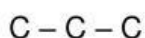
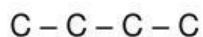
10. Place the following compounds into their correct families on the table.

CH_3COCH_3	C_2H_5OH	C_4H_8	C_3H_7OH	C_4H_6
CH_3COOCH_3	C_2H_5COOH	CH_3OH	CH_3CHCH_2	C_5H_{10}
CH_3CHO	$CH_3CH_2COCH_3$	C_3H_4	$HCOOH$	C_2H_2
C_3H_7CCH	$C_4H_9COOC_2H_5$	$C_{12}H_{24}$	$C_5H_{11}OH$	C_2H_4

alkanes	alkenes	alkynes	alcohols	carboxylic acids	ketones	aldehydes	esters

11. You have four colourless liquids that you know are hexane, hexene, ethanol and ethanoic acid. Describe how you would identify these using bromine water and litmus.

12. Given the following structural formulae, answer the questions that follow.



- (a) Name the following : A = _____ B = _____
C = _____ E = _____
- (b) Which two compounds are different ways of drawing the same compound? Name this compound? _____
- (c) Which two compounds are isomers of each other? Give their molecular formula.

- (d) Which compound would decolourise bromine water? _____
- (e) Which compound would turn moist blue litmus paper red? _____
- (f) Compound F can be prepared using one of the other listed compounds and another **not** listed.
- (i) Which is the listed compound? _____
- (ii) What other organic compound must be reacted with this listed compound

- (iii) What other compound must also be present in the reaction mixture to promote the formation of F? Give two functions of this compound.

- (iv) What is the name of compound F? _____