

Organic: Reactions

- Chlorine gas, $\text{Cl}_{2(g)}$, is reacted with several hydrocarbons. When reacted with _____, one of the products of the reaction will be hydrogen chloride, $\text{HCl}_{(g)}$
 - C_3H_6
 - C_5H_8
 - C_5H_{10}
 - C_6H_6
- A few drops of bromine, $\text{Br}_{2(l)}$, is added to each of the following hydrocarbons. The color of the bromine would disappear the most quickly in _____.
 - C_4H_{10}
 - C_6H_6
 - C_7H_{14}
 - C_8H_{18}
- Chemical properties of an unknown organic compound were tested with bromine and potassium permanganate solution. It was found that the **unknown compound** decolorized potassium permanganate solution and gave a non- acidic product with bromine. The unknown organic compound was most likely _____.
 - 2-methyl butane
 - 3,3-diethyl octane
 - hex- 2- ene
 - benzene
- Given 1.0 mol of each substances below, the compound that would require the most $\text{Br}_{2(l)}$ for an addition reaction is _____.
 - C_4H_{10}
 - C_5H_{12}
 - C_6H_{10}
 - C_7H_{14}
- The esterification of propanol with butanoic acid forms _____ and _____.

a)	Butylpropanoate	water
b)	Propylbutanoate	water
c)	Butylpropanone	Hydrogen
d)	Propylbutenoate	hydrogen
- A student has been asked to prepare octylethanoate, an artificial orange flavour. The student could prepare the octylethanoate by reacting _____ with _____.

a)	Heptanol	Ethanoic acid
b)	Octanol	Ethanoic acid
c)	Ethanol	Octanoic acid
d)	Octanol	Methanoic acid
- Ethanol is a byproduct of the process of _____, where _____ reacts with _____.

a)	Hydrogenation	Ethane	Hydrogen
b)	Hydration	Ethene	Water
c)	Hydrogenation	Ethene	Hydrogen
d)	Hydration	Ethane	Water

8. Consider the following addition reaction. $\text{CH}_3\text{CHCHCH}_2\text{CH}_3 + \text{Cl}_2 \rightarrow$ _____

The expected product(s) is/are _____

- a) 2-chloropentane and hydrogen chloride
- b) 3,4-dichloropentane
- c) 2,3-dichloropentane
- d) 2-chloropent-3-ene and hydrogen chloride

9. The most likely species to undergo a substitution reaction would be _____

- a) 2-methyl-prop-1-ene
- b) o-dimethylbenzene
- c) acetylene
- d) but-2-yne

10. The most likely species to undergo an addition reaction would be _____

- a) benzoic acid
- b) 2-methylpropane
- c) propyne
- d) propan-1,2-diol

11. Name the most likely product(s) for the following reaction.



- a) 1,2-dichloropropane and hydrogen
- b) 1-chloropropane and hydrogen
- c) 2-chloropropane and hydrogen chloride
- d) 3-chloroprop-1-ene and hydrogen chloride

12. The most likely species to undergo a substitution reaction would be _____

- a) 3-methylpent-1-ene
- b) 2,3 - dimethylbutane
- c) 1,1-dichlorobut-2-yne
- d) octa-1,3-diene

13. The most likely species to undergo an addition reaction would be _____

- a) p-chlorofluorobenzene
- b) 2-phenylpropane
- c) propyne
- d) propan-1,2-diol

14. Compounds that will undergo addition reactions are:
- alcohols and alkanes
 - alkenes and alkynes
 - aromatics and alkanes
 - esters and aromatics
15. If an alkene undergoes hydration it will form _____ whereas when it undergoes hydrogenation it will form a(n) _____.
- alkane, alcohol
 - alkyne, acid
 - aromatic, alcohol
 - alcohol, alkane
16. The organic compound that will undergo an addition reaction with $F_{2(g)}$ is
- C_4H_8
 - C_6H_6
 - CCl_4
 - CH_3COOH
17. The ester ethylmethanoate is formed by the reaction between the alcohol _____ and the carboxylic acid _____
- C_2H_5OH , $HCOOH$
 - CH_3OH , CH_3OOH
 - C_2H_5OH , CH_3COOH
 - CH_3OH , $HCOOH$

18. Consider the incomplete reaction as follows: $C_2H_{4(g)} + Br_{2(l)} \rightarrow$ product

This is a(n) _____ reaction and the product(s) will be _____

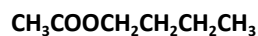
a	Addition	Bromoethane and hydrogen bromide
b	Addition	1,2-dibromoethane
c	Substitution	Bromoethane and hydrogen bromide
d	substitution	1,2-dibromoethane

19. A sample of propene undergoes a reaction with chlorine.

The reaction will be called a(n) _____ reaction, and the product(s) will be _____

- substitution, 1-chloropropane and hydrochloric acid
- addition, 1,1-dichloropropane
- substitution, 1,2-dichloropropane
- addition, 1,2-dichloropropane

20. Consider the diagram below. It is formed by the addition of _____ and _____



- a) hexanoic acid, water
- b) butanol, ethanoic acid
- c) ethanol, butanoic acid
- d) propanol, water

21. The chemical below that is most likely to undergo an addition reaction with $\text{Br}_{2(l)}$ is

- a) benzene
- b) fluoroethane
- c) acetylene
- d) ethanol

22. Consider the reactions in the table below.

prop-1-ene + chlorine $\rightarrow$ 1,2-dichloropropane
ethanol $\rightarrow$ ethene + water
ethane + fluorine $\rightarrow$ fluorethane + hydrogen fluoride
benzene + bromine $\rightarrow$ bromobenzene + hydrogen bromide
Methanol + Ethanoic acid $\rightarrow$ methylethanoate + water

There is / are _____ **addition reaction(s)** given in the table above.

- | | |
|------|------|
| a) 1 | b) 2 |
| c) 3 | d) 4 |

23. **Numerical response question**

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Left justify your answer in the boxes provided.

Jake just bought a propane-fuelled mini-bus. The combustion of propane can be written as:



Balance the equation with the lowest possible whole numbers and record the values of 'a,b,c,d' in that order

24. **Numerical response question**

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Left justify your answer in the boxes provided.

Colin mixed a sample of Ethanoic acid and methanol in the presence of a catalyst.

Identify the product(s) for this esterification reaction. Record the answers in ascending order:

1. Ethyl methanoate
2. Methyl ethanoate
3. Water
4. Ethyl ethanoate
5. Methyl methanoate

Solutions:

1. D
2. C
3. C
4. C
5. B
6. B
7. B
8. C
9. B
10. C
11. C
12. B
13. C
14. B
15. D
16. A
17. A
18. B
19. D
20. b
21. C
22. A
23. 1534
24. 23