

Name _____ Date _____



Practice with Organic Reactions

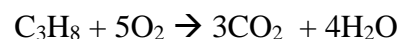
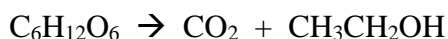
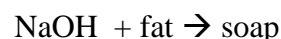
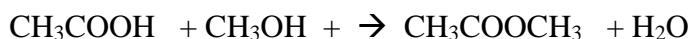
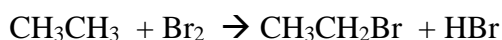
Directions: For each of the seven organic reactions below, use the word bank to fill in the missing blanks in the description as well as the reaction name. Then copy the appropriate example into the table as well.

Reaction names are in bold.

Word Bank

Addition	Alcohol/ethanol	Base	Combustion	Double or triple
Esterification	Fermentation	monomers	Organic acid	Polymerization
Saponification	soap	Substitution	water	

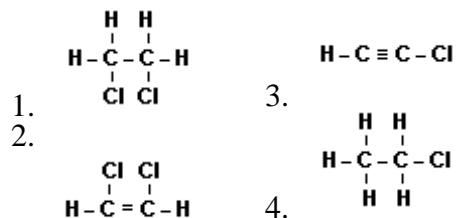
Examples:



Reaction Name	Description (with example)
1.	Reacts sugar (carbohydrate) in presence of yeast and often produces _____ and carbon dioxide Ex:
2.	Combines many small molecules (similar or identical molecules called _____) into one large molecule Ex:
3.	Combines _____ and an alcohol Ex:
4.	Combines fat and _____ to make a _____ Ex:
5.	Adds to hydrogen or halogen to an unsaturated hydrocarbon (unsaturated hydrocarbons have this kind of carbon bond: _____) Ex:
6.	Replace a hydrogen on a saturated hydrocarbon with a halogen (halogens are found in Group _____) (-- <i>numbers are not in word bank!</i>) Ex:
7.	Combine _____ with oxygen (burn), and produce carbon dioxide and _____ Ex:

Practice Questions (Give reason/ show work for multiple choice!)

1. Which structural formula represents the products formed from the reaction of Cl_2 and C_2H_4 ?



2. An alcohol and an organic acid are combined to form water and a compound with a pleasant odor. This reaction is an example of

- a) Saponification b) esterification c) polymerization d) fermentation

3. Which equation represents a substitution reaction?

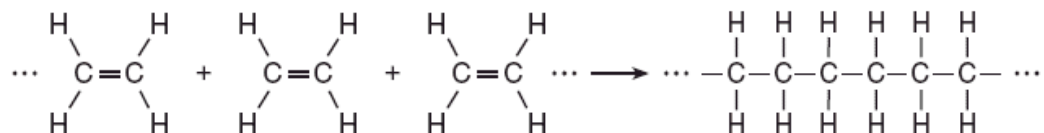
- a) $\text{CH}_4 + 2\text{O}_2 \rightarrow \text{CO}_2 + 2\text{H}_2\text{O}$
b) $\text{C}_2\text{H}_4 + \text{Br}_2 \rightarrow \text{C}_2\text{H}_4\text{Br}_2$
c) $\text{C}_3\text{H}_6 + \text{H}_2 \rightarrow \text{C}_3\text{H}_8$
d) $\text{C}_4\text{H}_{10} + \text{Cl}_2 \rightarrow \text{C}_4\text{H}_9\text{Cl} + \text{HCl}$

4. Given the equation: $\text{C}_6\text{H}_{12}\text{O}_6 \rightarrow 2\text{C}_2\text{H}_5\text{OH} + 2\text{CO}_2$

The chemical process illustrated by this equation is

- a) fermentation b) saponification c) esterification d) polymerization

5. Given the equation:



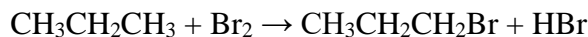
Which type of reaction is represented by this equation?

- a) Combustion b) Esterification c) Polymerization d) substitution

6. Which reaction results in the production of soap?

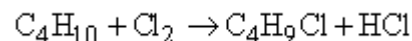
- a) Esterification b) Fermentation c) Polymerization d) saponification

7. Given the balanced equation below representing a reaction. This organic reaction is best classified as



- a) an addition reaction
b) an esterification reaction
c) a polymerization reaction
d) a substitution reaction

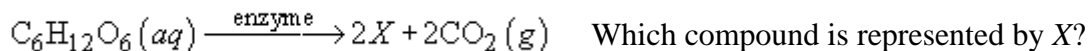
8. Given the balanced equation for an organic reaction between butane and chlorine that takes place at 300.°C and 101.3 kilopascals:



Identify the type of organic reaction shown in the chemical equation.

- a) addition b) saponification c) fermentation d) substitution

9. Given the balanced equation with an unknown compound represented by X:



- a) $\text{CH}_3\text{OH}(\text{aq})$ b) $\text{CH}_2(\text{OH})_4(\text{aq})$ c) $\text{CH}_3\text{CH}_2\text{OH}(\text{aq})$ d) $\text{CH}_2\text{OHCH}_2\text{OH}(\text{aq})$

10. Given the balanced equation for an organic reaction: $\text{C}_2\text{H}_2 + 2\text{Cl}_2 \rightarrow \text{C}_2\text{H}_2\text{Cl}_4$

This reaction is best classified as

- a) addition b) esterification c) fermentation d) substitution

11. $\text{X}(\text{g}) + \text{Cl}_2(\text{g}) \rightarrow \text{XCl}_2(\text{g})$

Which compound could be represented by X?

- a) CH_4 b) C_2H_4 c) C_3H_8 d) C_4H_{10}

12. Given the reaction between 1-butene and chlorine gas: $\text{C}_4\text{H}_8 + \text{Cl}_2 \rightarrow \text{C}_4\text{H}_8\text{Cl}_2$

Which type of chemical reaction is represented by this equation?

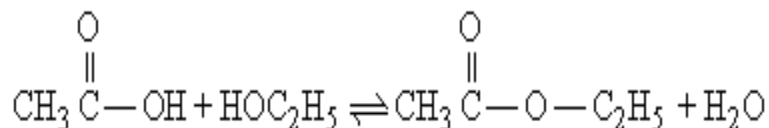
- a) Addition b) Hydrogenation c) Substitution d) esterification

13. Given the equation: butanoic acid + 1-pentanol $\xrightarrow{\text{catalyst}}$ water + X

To which class of organic compounds does product X belong?

- a) alcohol b) Ester c) Ether d) alkane

14. Given the reaction:



This reaction is an example of

- a) fermentation b) saponification c) hydrogenation d) esterification

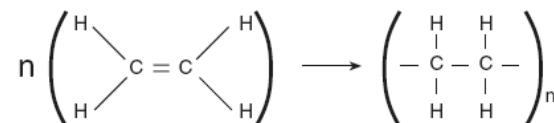
15 Given the equation: $C_2H_6 + Cl_2 \rightarrow C_2H_5Cl + HCl$

This reaction is best described as

- a) addition involving a saturated hydrocarbon
- b) addition involving an unsaturated hydrocarbon
- c) substitution involving a saturated hydrocarbon
- d) substitution involving an unsaturated hydrocarbon

16. Which type of reaction is represented by the equation below?

Note: n and n are very large numbers equal to about 2000.



- a) Esterification
- 2. Fermentation
- 3. Saponification
- 4. polymerization

17. Which formula correctly represents the product of an addition reaction between ethene and chlorine?

- a) CH_2Cl_2
- b). CH_3Cl
- c) $C_2H_4Cl_2$
- d) C_2H_3Cl

18. The reaction $nC_2H_4 \rightarrow (-C_2H_4-)_n$ is an example of

- a) Saponification
- b) Esterification
- c) Polymerization
- d) fermentation

19. The process of joining many small molecules into larger molecules is called

- a) neutralization
- b) polymerization
- c) saponification
- d) substitution

20. What type of reaction is $CH_3CH_3 + Cl_2 \rightarrow CH_3CH_2Cl + HCl$

- a) addition
- b) Substitution
- c) Saponification
- d) esterification