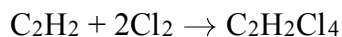


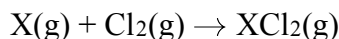
1. Given the balanced equation for an organic reaction:



This reaction is best classified as

- A) addition B) esterification
C) fermentation D) substitution

2. Given the incomplete equation representing an organic addition reaction:



Which compound could be represented by X?

- A) CH_4 B) C_2H_4
C) C_3H_8 D) C_4H_{10}

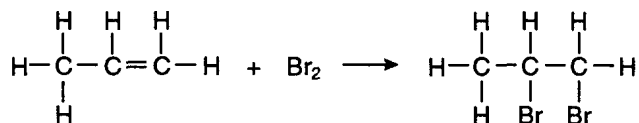
3. Which formula correctly represents the product of an addition reaction between ethene and chlorine?

- A) CH_2Cl_2 B) CH_3Cl
C) $\text{C}_2\text{H}_4\text{Cl}_2$ D) $\text{C}_2\text{H}_3\text{Cl}$

4. As an addition reaction occurs, the number of electrons shared between carbon atoms

- A) decreases B) increases
C) remains the same

5. Base your answer to the following question on the organic reaction below.



This reaction is an example of

- A) fermentation B) addition
C) substitution D) saponification

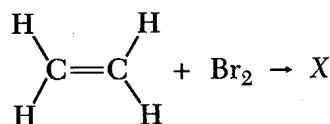
6. Which is an example of an addition reaction?

- A) $\text{CH}_3\text{COOH} + \text{CH}_3\text{OH} \rightarrow \text{CH}_3\text{COOCH}_3 + \text{H}_2\text{O}$
B) $\text{C}_2\text{H}_6 + \text{Cl}_2 \rightarrow \text{C}_2\text{H}_5\text{Cl} + \text{HCl}$
C) $\text{C}_3\text{H}_6 + \text{H}_2 \rightarrow \text{C}_3\text{H}_8$
D) $\text{C}_6\text{H}_{12}\text{O}_6 \rightarrow 2 \text{C}_2\text{H}_5\text{OH} + 2 \text{CO}_2$

7. In which type of reaction can an unsaturated hydrocarbon become saturated?

- A) substitution with hydrogen
B) reduction with oxygen
C) addition
D) oxidation with oxygen

8. Consider the reaction below:



What is the structural formula of the product represented by the X?

- A) $\begin{array}{c} \text{H} & \text{H} \\ | & | \\ \text{H}-\text{C}-\text{C}-\text{H} \\ | & | \\ \text{H} & \text{Br} \end{array}$ B) $\begin{array}{c} \text{H} & \text{Br} \\ | & | \\ \text{H}-\text{C}-\text{C}-\text{H} \\ | & | \\ \text{H} & \text{H} \end{array}$
C) $\begin{array}{c} \text{H} & \text{H} \\ | & | \\ \text{H}-\text{C}-\text{C}-\text{H} \\ | & | \\ \text{Br} & \text{Br} \end{array}$ D) $\begin{array}{c} \text{H} & \text{H} \\ | & | \\ \text{H}-\text{C}=\text{C}-\text{H} \\ | & | \\ \text{Br} & \text{Br} \end{array}$

9. The reaction



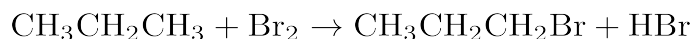
is an example of

- A) addition B) substitution
C) saponification D) esterification

10. Which structural formula represents the product formed from the reaction of Cl_2 and C_2H_4 ?

- A) $\begin{array}{c} \text{H} & \text{H} \\ | & | \\ \text{H}-\text{C}-\text{C}-\text{H} \\ | & | \\ \text{Cl} & \text{Cl} \end{array}$ B) $\begin{array}{c} \text{Cl} & \text{Cl} \\ | & | \\ \text{H}-\text{C}=\text{C}-\text{H} \end{array}$
C) $\text{H}-\text{C}\equiv\text{C}-\text{Cl}$ D) $\begin{array}{c} \text{H} & \text{H} \\ | & | \\ \text{H}-\text{C}-\text{C}-\text{Cl} \\ | & | \\ \text{H} & \text{H} \end{array}$

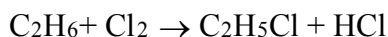
11. Given the balanced equation representing a reaction:



This organic reaction is best classified as

- A) an addition reaction
- B) an esterification reaction
- C) a polymerization reaction
- D) a substitution reaction

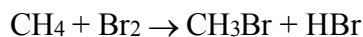
12. Given the equation:



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

13. Given the equation:



Which type of reaction does this equation represent?

- A) addition
- B) hydrogenation
- C) polymerization
- D) substitution

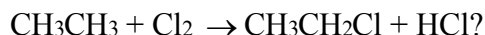
14. Which compound will undergo a substitution reaction with chlorine?

- A) CH_4
- B) C_2H_4
- C) C_3H_6
- D) C_4H_8

15. Which hydrocarbon will undergo a substitution reaction with chlorine?

- A) methane
- B) ethyne
- C) propene
- D) butene

16. What type of reaction is

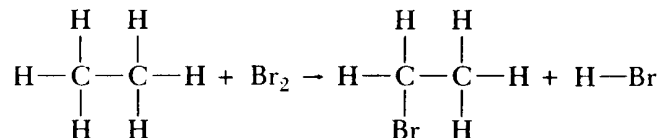


- A) an addition reaction
- B) a substitution reaction
- C) saponification reaction
- D) an esterification reaction

17. Which equation represents a substitution reaction?

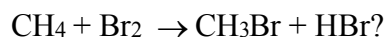
- A) $\text{C}_2\text{H}_4 + \text{H}_2 \rightarrow \text{C}_2\text{H}_6$
- B) $\text{CH}_4 + 2 \text{O}_2 \rightarrow \text{CO}_2 + 2 \text{H}_2\text{O}$
- C) $\text{C}_3\text{H}_8 + \text{Cl}_2 \rightarrow \text{C}_3\text{H}_7\text{Cl} + \text{HCl}$
- D) $\text{C}_4\text{H}_8 + \text{Br}_2 \rightarrow \text{C}_4\text{H}_8\text{Br}_2$

18. Which organic product is formed by the reaction below?



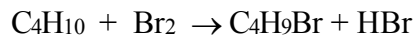
- A) bromoethane
- B) bromoethene
- C) bromoethyne
- D) bromobenzene

19. Which type of reaction is represented by the equation



- A) substitution
- B) addition
- C) esterification
- D) polymerization

20. The reaction



is an example of

- A) substitution
- B) addition
- C) fermentation
- D) polymerization