



REACTIONS OF ALCOHOLS

Answers all the questions below then check your answers

1. Fill in the gap: The reaction of alcohols with oxygen is called _____.
2. True or False: The solubility of alcohols in water generally decreases as the size of the alcohol molecule increases.
3. Write the balanced chemical equation for the complete combustion of ethanol (C_2H_5OH).
4. Name the two products formed when sodium reacts with ethanol.
5. Describe the trend in solubility of alcohols in water as the length of the carbon chain increases. Explain the reason for this trend.
6. Describe the differences in the rate of the reaction between sodium and ethanol and sodium with water.
7. Write the balanced chemical equations for the reactions of methanol, ethanol, and propanol with sodium.
8. How are alcohols oxidised to carboxylic acids in the lab?

9. Which alcohol will be the most soluble in water?
- (a) Methanol
 - (b) Ethanol
 - (c) Propanol
 - (d) Butanol
10. The reaction of sodium with ethanol produces:
- (a) Sodium hydroxide and hydrogen
 - (b) Sodium ethoxide and hydrogen
 - (c) Sodium ethoxide and water
 - (d) Sodium hydroxide and water
11. Which of the following is the oxidizing agent used in the oxidation of ethanol to ethanoic acid?
- (a) Potassium dichromate
 - (b) Sulfuric acid
 - (c) Ethanol
 - (d) Ethanoic acid
- (a) Potassium dichromate - It is a strong oxidizing agent commonly used in this reaction.

12. The complete combustion of propanol (C_3H_7OH) produces:

(a) Carbon monoxide and water

(b) Carbon dioxide and hydrogen

(c) Carbon dioxide and water

(d) Carbon monoxide and hydrogen

(c) Carbon dioxide and water

13. Name the product of oxidation of the alcohols methanol, ethanol and propanol with an acidified potassium dichromate solution.

Methanol- methanoic acid

Ethanol- ethanoic acid

Propanol- propanoic acid

Answers

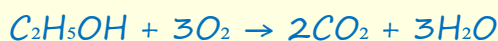
1. Fill in the gap: The reaction of alcohols with oxygen is called _____.

Combustion

2. True or False: The solubility of alcohols in water generally decreases as the size of the alcohol molecule increases.

True - small alcohol molecules are soluble in water but as the size of the alcohol molecule increases the solubility decreases.

3. Write the balanced chemical equation for the complete combustion of ethanol (C_2H_5OH).



4. Name the two products formed when sodium reacts with ethanol.

Sodium ethoxide (C_2H_5ONa) and hydrogen gas (H_2)

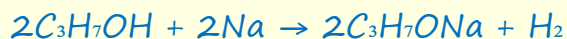
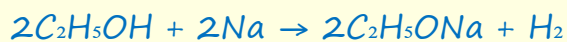
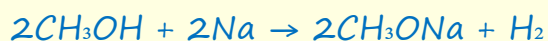
5. Describe the trend in solubility of alcohols in water as the length of the carbon chain increases. Explain the reason for this trend.

Solubility decreases as the carbon chain gets longer. This is because the hydrocarbon part of the molecule becomes larger relative to the hydroxyl ($-OH$) group, making the molecule less soluble.

6. Describe the differences in the rate of the reaction between sodium and ethanol and sodium with water.

The rate of reaction of sodium with ethanol is slower than with water.

7. Write the balanced chemical equations for the reactions of methanol, ethanol, and propanol with sodium.



8. How are alcohols oxidised to carboxylic acids in the lab?

Alcohols are refluxed with a strong oxidizing agents such acidified potassium dichromate ($\text{K}_2\text{Cr}_2\text{O}_7/\text{H}_2\text{SO}_4$).

9. Which alcohol will be the most soluble in water?

(a) Methanol

(b) Ethanol

(c) Propanol

(d) Butanol

a) Methanol - It has the shortest carbon chain

10. The reaction of sodium with ethanol produces:

(a) Sodium hydroxide and hydrogen

(b) Sodium ethoxide and hydrogen

(c) Sodium ethoxide and water

(d) Sodium hydroxide and water

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