



Reactions of Alcohols – Exam Practice Questions

- Which statement about alcohols is correct?
 - All alcohols are insoluble in water
 - Alcohols combust to form carbon monoxide and water
 - Smaller alcohols are generally more flammable than larger ones
 - Alcohols react with sodium to form sodium hydroxide
- Write a balanced equation for the complete combustion of ethanol.
- Explain why methanol is more soluble in water than butanol.
- Describe the trend in the rate of reaction of alcohols with sodium as carbon chain length increases.
- Fill in the gap to complete the equation:
$$2\text{R-OH} + 2\text{Na} \rightarrow \text{_____} + \text{H}_2$$
- Sodium reacts more slowly with ethanol than with water. Explain why.
- State whether the following are true or false:
 - All alcohols are fully miscible with water
 - Hydrogen gas is released when alcohols react with sodium
 - Combustion of alcohols is an oxidation reaction

Answers

1. Which statement about alcohols is correct?

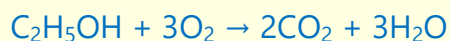
- A. All alcohols are insoluble in water
- B. Alcohols combust to form carbon monoxide and water
- C. Smaller alcohols are generally more flammable than larger ones
- D. Alcohols react with sodium to form sodium hydroxide

Answer:

C. Smaller alcohols are more volatile and therefore more flammable.

2. Write a balanced equation for the complete combustion of ethanol.

Answer:



3. Explain why methanol is more soluble in water than butanol.

Answer:

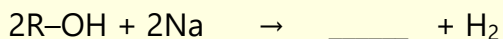
Methanol has a much shorter non-polar hydrocarbon chain, so the polar hydroxyl group dominates. It can form hydrogen bonds with water. In butanol, the longer non-polar chain reduces hydrogen bonding and lowers solubility.

4. Describe the trend in the rate of reaction of alcohols with sodium as carbon chain length increases.

Answer:

As the carbon chain length increases, the rate of reaction with sodium decreases.

5. Fill in the gap to complete the equation:



Answer:

2RO-Na^+ (alkoxide ion paired with sodium ions)

6. Sodium reacts more slowly with ethanol than with water. Explain why.

Answer:

In ethanol, the hydroxyl group is attached to a hydrocarbon chain which reduces the polarity of the O-H bond compared to water. This makes the hydrogen harder to remove, so the reaction is slower.

7. State whether the following are true or false:

- a) All alcohols are fully miscible with water
- b) Hydrogen gas is released when alcohols react with sodium
- c) Combustion of alcohols is an oxidation reaction

Answer:

- a) False
- b) True
- c) True