



## Reactions of Alcohols – Exam Practice Questions

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
2. Write a balanced equation for the complete combustion of ethanol.
3. Explain why methanol is more soluble in water than butanol.
4. Describe the trend in the rate of reaction of alcohols with sodium as carbon chain length increases.
5. Fill in the gap to complete the equation:  
$$2R-OH + 2Na \rightarrow \underline{\quad} + H_2$$
6. Sodium reacts more slowly with ethanol than with water. Explain why.
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

## Answers

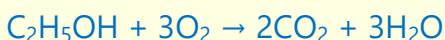
1. Which statement about alcohols is correct?
  - A. All alcohols are insoluble in water
  - B. Alcohols combust to form carbon monoxide and water
  - C. Smaller alcohols are generally more flammable than larger ones
  - D. Alcohols react with sodium to form sodium hydroxide

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:

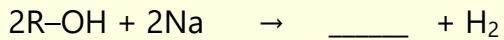
Methanol has a much shorter non-polar hydrocarbon chain, so the polar hydroxyl group dominates. It can form hydrogen bonds with water. In butanol, the longer non-polar chain reduces hydrogen bonding and lowers solubility.

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