

What are Alcohols?

Worksheet

Alcohols contain the -OH functional group and are classified by carbon type: primary (1), secondary (2), or tertiary (3). They oxidize to aldehydes, ketones, or carboxylic acids depending on type.

Questions

1. CH₃CH(OH)CH₃ is which class of alcohol?
 - A) Primary
 - B) Secondary
 - C) Tertiary
 - D) Quaternary
2. Primary alcohols oxidize to
 - A) Ketones
 - B) Aldehydes
 - C) Carboxylic acids
 - D) Esters
3. Why is tert-butanol resistant to oxidation?
 - A) It's insoluble
 - B) No H on C-OH
 - C) Wrong functional group
 - D) Too stable
4. Which oxidation product is from a secondary alcohol?
 - A) Aldehyde
 - B) Ketone
 - C) Ether
 - D) Alkane
5. Classify CH₃CHOH (ethanol) and predict its oxidation product.
6. What happens when 2-propanol (secondary) undergoes oxidation?
7. Can 2-methylpropan-2-ol (tertiary) be oxidized?
8. Define: What makes an alcohol primary, secondary or tertiary?
9. Define: What does a primary alcohol oxidize to?
10. Define: Can tertiary alcohols be oxidized?

Answer Key

1. B) Secondary - The C-OH carbon has 2 other carbons attached secondary.
2. B) Aldehydes - Aldehydes first (1-step), then carboxylic acids (2-step).
3. B) No H on C-OH - Tertiary: (CH)₃C-OH has no H on the C-OH carbon.
4. B) Ketone - Secondary alcohols ketones (RC=O).
5. Count carbons bonded to C-OH: only 1 other carbon Ethanol is PRIMARY (1) Primary alcohols oxidize to aldehydes Product: CHCHO (acetaldehyde)
6. 2-propanol: (CH)₂CHOH has 2 carbons bonded to C-OH It is SECONDARY (2) Secondary alcohols oxidize to ketones Product: CHCOCH (acetone)
7. (CH)₃C-OH has 3 carbons bonded to C-OH It is TERTIARY (3) Tertiary alcohols resist oxidation (no H on carbon) No reaction under mild conditions
8. The number of carbon atoms bonded to the carbon bearing the OH group: 1, 2, or 3.
9. An aldehyde (R-CHO), then further to a carboxylic acid.
10. No, not under mild conditions - they lack a hydrogen on the C-OH carbon.

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