

Advanced Organic Chemistry Assessment

Chemistry · Answer Key · 12 Questions

1. What is the IUPAC name for the product formed when 2-methylbut-2-ene reacts with hydrogen bromide in the presence of a peroxide catalyst?

A) 1-bromo-2-methylbutane

B) 2-bromo-2-methylbutane

C) 2-bromobutane

D) 1-bromo-3-methylbutane

2. Which of the following compounds exhibits the highest boiling point?

A) Pentane

B) 1-butanol

C) Butanoic acid

D) Butyl ethanoate

3. In the reaction of benzene with concentrated nitric acid and concentrated sulfuric acid, what is the electrophile generated?

A) NO_2^+

B) NO_3^-

C) HSO_4^-

D) NO^+

4. Which reagent is most effective for distinguishing between a primary alcohol and a tertiary alcohol?

A) Acidified potassium dichromate

B) Bromine water

C) Sodium carbonate

D) Silver nitrate solution

5. What is the major product of the dehydration of 2-methylbutan-2-ol using concentrated sulfuric acid?

A) 2-methylbut-1-ene

B) 3-methylbut-1-ene

C) 2-methylbut-2-ene

D) 2-methylbutan-2-ol

6. Which of the following isomers of C_4H_8 undergoes addition polymerization?

A) Cyclobutane

B) But-1-ene

C) 2-methylpropene

D) Both B and C

7. Which statement regarding optical isomerism is strictly true?

- A) All chiral molecules contain a chiral carbon atom.
- B) Enantiomers have different chemical properties in a chiral environment.**
- C) Meso compounds are optically active.
- D) A racemic mixture rotates plane-polarized light.

8. What is the product of the reaction between propanal and Tollens' reagent?

- A) Propanone
- B) Propanoic acid**
- C) Propan-1-ol
- D) Propyl propanoate

9. Which compound is formed by the nucleophilic substitution reaction between 1-bromopropane and excess ammonia?

- A) Propylamine**
- B) Propanamide
- C) Propylammonium bromide
- D) Propylnitrile

10. What is the hybridization state of the carbon atoms in the carbonyl group of an ester?

- A) sp
- B) sp²**
- C) sp³
- D) d²sp³

11. Which of the following pairs represent tautomers?

- A) Propanone and propan-1-ol
- B) Ethanol and methoxymethane
- C) Propan-2-one and prop-1-en-2-ol**
- D) But-1-ene and but-2-ene

12. Which reaction type is involved in the conversion of an ester into a carboxylic acid and an alcohol using dilute acid?

- A) Addition
- B) Substitution
- C) Hydrolysis**
- D) Elimination