


Name:**Score:** 0 / 20 points (0%)

Chapter 9 Review Quiz

Multiple Choice


Identify the choice that best completes the statement or answers the question.

-  1. The functional group of aldehydes is:
- R—OH .
 - R—CO—R .
 - R—CHO .
 - R—COOH .

ANSWER: C

A = alcohol, B = ester, D = carboxylic acid.


POINTS: 0 / 1**FEEDBACK:****REF:** 273

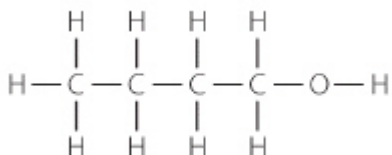
-  2. Aldehydes:
- are produced by the oxidation of a secondary alcohol.
 - contain COOH as the terminal carbon.
 - form dipole–dipole forces of attraction between molecules.
 - increase in solubility as the chain length increases.

ANSWER: C

The carbonyl group forms dipole–dipole forces between molecules.

POINTS: 0 / 1**FEEDBACK:****REF:** 274

-  3. What type of alcohol is the following?




- primary
- secondary
- tertiary
- quaternary

ANSWER: A

The functional group is attached to a carbon that is attached to only one other carbon; therefore, it is a primary alcohol.

POINTS: 0 / 1**FEEDBACK:****REF:** 266

-  4. Which of the following statements about functional groups is incorrect?
- They give the physical properties of a homologous series.
 - They give the chemical properties of a homologous series.
 - They are a group of identically arranged atoms in each member of a homologous series.
 - They allow prediction of chemical reactions of a homologous series.


ANSWER: A

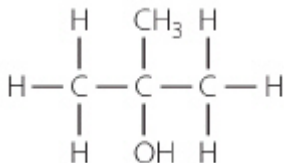
Functional groups give similar chemistry. Physical properties are given by the length/size of the hydrocarbon chain.

POINTS: 0 / 1

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REF: 263

 5. What is the correct name of the molecule shown?



- a. 2-methyl-2-propanone
- b. 2-methyl-2-propanol
- c. 2-butanol
- d. 2-methylpropanol

ANSWER: B

Both the methyl group and alcohol functional group are on the 2nd carbon. Main chain has three carbons.

POINTS: 0 / 1

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REF: 265

 6. Which of the following lists contains only isomers of 3-pentanol?

- a. 2-pentanol, 2-methyl-1-propanol, 1-pentanol
- b. 2-pentanol, 2-methyl-1-butanol, 1-pentanol
- c. 1-pentanol, 2,2-dimethyl-1-propanol, 2-methyl-1-pentanol
- d. 2,2-dimethyl-1-propanol, 2-methyl-1-propanol, 2-pentanol


ANSWER: B

Isomers of 3-pentanol must have 5 carbons and must keep the alcohol functional group in the molecule.

POINTS: 0 / 1

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REF: 265

 7. Ethanol has a significantly higher boiling point than ethane because:

- a. it has more atoms so forms stronger dispersion forces.
- b. it has a larger molecular mass than ethane.
- c. the alcohol functional group forms hydrogen bonds between molecules not present between ethane molecules.
- d. ethanol is larger than the ethane molecule so has stronger forces between molecules.


ANSWER: C

The functional group in alcohols can form hydrogen bonds that are much stronger than the dispersion forces of ethane.

POINTS: 0 / 1

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REF: 268

 8. Small chain alcohols like propanol and butanol are more soluble in water than comparable alkanes like propane and butane because:

- a. alcohols are larger molecules so form stronger dispersion forces to bond to water molecules than alkanes.
- b. alkanes repel water while alcohols attract water.
- c. alcohols contain a functional group that can form hydrogen bonds with water, but alkanes do not.

d. alcohols fit between water molecules better than alkane molecules.

ANSWER: C

The hydroxyl functional group can form hydrogen bonds and thus be soluble in water. Alkanes do not form hydrogen bonds with water so are not very soluble.

POINTS: 0 / 1

FEEDBACK:

REF: 268



9. Aldehydes and ketones:

- both have the carbonyl group at the end of the carbon chain.
- have the general formula RCOH
- have the same carbonyl group in different locations on the carbon chain.
- have significantly different physical properties.

ANSWER: C

Both aldehydes and ketones have a carbonyl group. It is on the terminal carbon for aldehydes, but in the middle of the chain for ketones.

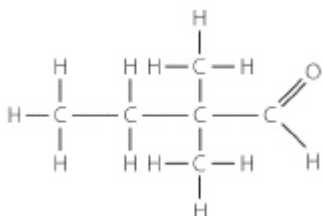
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10. What are the correct names for the following aldehyde and ketone?



- | | | | |
|--------------|---------------------|---------|-------------|
| a. aldehyde: | 2,2-dimethylbutanal | ketone: | 2-pentanone |
| b. aldehyde: | 2-methylpentanal | ketone: | 2-pentanal |
| c. aldehyde: | 2,2-dimethylbutanal | ketone: | pentanone |
| d. aldehyde: | dimethylbutanal | ketone: | 2-pentanone |

ANSWER: A

Naming compounds follows specific IUPAC rules.

POINTS: 0 / 1

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REF: 273



11. Aldehydes and ketones like propanal and propanone are functional group isomers because:

- they have the same functional group.
- they have different functional groups but the same molecular formula.
- they have the same empirical formula but different structural formulas.
- they have the same number of carbons.

ANSWER: B

Functional group isomers have the same molecular formula but have different functional groups. Aldehydes and ketones have similar but not the same functional group.

POINTS: 0 / 1

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REF: 274



12. Aldehydes and ketones have boiling points:

- higher than alkanes but lower than alcohols of similar size.
- approximately the same as alkanes, but lower than alcohols of similar size.
- higher than alkanes, but approximately the same as alcohols of similar size.

d. higher than both alkanes and alcohols of similar size.


ANSWER: A

Alkanes have the lowest boiling points as they have dispersion forces between molecules. Aldehydes and ketones are stronger as they have dipole-dipole forces. Alcohols are higher due to the formation of hydrogen bonds between molecules.

POINTS: 0 / 1

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REF: 274

 13. The main intermolecular forces between aldehyde and ketone molecules is:

- a. dispersion forces.
- b. dipole–dipole forces.
- c. hydrogen bonds.
- d. covalent bonds.

ANSWER: B

Due to the polar carbonyl group, dipole–dipole forces form between molecules.

POINTS: 0 / 1

FEEDBACK:

REF: 274

 14. Carboxylic acids:

- a. contain the carbonyl functional group.
- b. can have the functional group on a terminal carbon or in the middle of the carbon chain.
- c. have a COOH functional group.
- d. have lower boiling points than aldehydes and ketones of similar size.


ANSWER: C

The COOH functional group is the correct representation of carboxylic acids.

POINTS: 0 / 1

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REF: 276

 15. Carboxylic acids have boiling points:

- a. significantly higher than other similar sized molecules due to stronger dispersion forces.
- b. that are high due to their large size.
- c. higher than aldehydes and alkanes, but lower than alcohols of similar size.
- d. higher than alcohols, aldehydes and alkanes of similar size.


ANSWER: D

The carboxylic acid functional group forms both dipole-dipole forces and hydrogen bonds between molecules, so the forces are stronger than for alcohols (hydrogen bonds only) or alkanes (dispersion forces only).

POINTS: 0 / 1

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REF: 277

 16. A dimer forms when:

- a. carboxylic acids form hydrogen bonds with water molecules.
- b. two carboxylic acids bond with each other with dispersion forces.
- c. two carboxylic acids bond with each other with hydrogen bonds.
- d. carboxylic acids form hydrogen bonds with other molecules like alcohols or aldehydes.

ANSWER: C

ANSWER:

Dimers form between two carboxylic acid molecules.

POINTS: 0 / 1

FEEDBACK:

REF: 277

 17. Which of the following statements about carboxylic acids is incorrect?

- a. Carboxylic acids are strong acids.
- b. The carboxylic acid group is monoprotic.
- c. Carboxylic acids are more soluble than alcohols of similar size.
- d. Carboxylic acid solubility decreases as chain length increases.


ANSWER: A

All carboxylic acids are weak acids that only partially ionise.

POINTS: 0 / 1

FEEDBACK:

REF: 278

 18. Amines:

- a. have the functional group —NH—CO— .
- b. have the general formula RNH_2 .
- c. can only have a primary and secondary form.
- d. have lower boiling points than alkanes of similar size.

ANSWER: B

Option A gives the functional group of an amide, but the correct functional group is RNH_2 .

POINTS: 0 / 1

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REF: 280

 19. Amides are often solids at room temperature because:

- a. they are large molecules with strong dispersion forces between molecules.
- b. they have very polar functional groups that form hydrogen bonds between molecules.
- c. they have stronger dispersion forces than molecules of similar size.
- d. they do not dissolve well in water.


ANSWER: B

Amides have very polar groups that can form hydrogen bonds with water.

POINTS: 0 / 1

FEEDBACK:

REF: 284

 20. Small amides and amines are very soluble in water because:

- a. they form strong dispersion forces with water.
- b. they form strong dipole–dipole forces with water.
- c. they form strong hydrogen bonds with water.
- d. they are small so fit between water molecules.

ANSWER: C

Solubility in water relies upon the formation of hydrogen bonds not dipole–dipole or dispersion forces.

POINTS: 0 / 1

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