Carboxylic Acids Questions

Part 1: Circle the correct answer

1. Carboxylic acids have the general formula:
a) R-OH
b) R-COOH
c) R-CHO
d) R-NH2

2. Carboxylic acids are classified as:
a) Lewis bases
b) Brønsted-Lowry acids
c) Neutral compounds
d) Strong bases

3. The boiling point of carboxylic acids is high because of:
a) Ionic bonding
b) Hydrogen bonding and dimer formation
c) Covalent bonding
d) Low molecular weight

4. Which acid is found in vinegar?
a) Formic acid
b) Acetic acid
c) Oxalic acid
d) Benzoic acid

5. Carboxylic acids react with NaHCO■ to produce:
a) [redacted] gas H_2
b) [redacted] gas O_2
c) [redacted] gas CO_2
d) [redacted] gas N_2

6. Increasing the carbon chain length causes solubility in water to:
a) Increase
b) Decrease
c) Stay constant
d) Become zero immediately

7. Which reagent is used in the ferric chloride test?
a) NaOH
b) FeC■3
c) HCl
d) NH■Cl
4

8. Tollen's reagent is used to detect:
a) Alcohols
b) Reducing property
c) Alkanes
d) Ethers

9. Oxalic acid gives a white precipitate with:
a) NaCl
b) CaC■2
c) KOH

d) NH_3

10. Carboxylic acids in nonpolar media tend to:
a) Ionize completely
b) Form dimers
c) Break bonds
d) Evaporate instantly

Part 2: Fill in the blanks

1. Carboxylic acids act as _____ donors.

2. The gas released in sodium bicarbonate test is _____.

3. The bond in sodium carboxylate salts is _____ in nature.

4. Tartaric acid gives a _____ mirror with Tollen's reagent.

5. The solubility of carboxylic acids decreases as the _____ increases.

Part 3: Mention / Explain

1. Mention the general properties of carboxylic acids.

2. Mention two differences between carboxylic acids and alcohols.

3. Mention the steps of the ferric chloride test procedure.

4. Mention the observation of sodium carbonate test.

5. Mention the physical state of long-chain aliphatic acids at room temperature.

6. Mention the result of calcium chloride test with oxalic acid.

7. Mention the principle of Tollen's test for tartaric acid.

Model Answers

Part 1: 1-b 2-b 3-b 4-b 5-c 6-b 7-b 8-b 9-b 10-b

Part 2: 1- proton (H^+) 2- carbon dioxide (CO_2) 3- ionic 4- silver 5- chain length (molecular size)

Part 3: 1. Weak acids, form hydrogen bonds, high boiling points, soluble in water (small ones), form dimers. 2. Acids donate H^+, alcohols do not; acids have higher boiling points due to dimer formation. 3. Add ammonium hydroxide until alkaline, boil to remove ammonia, add ferric chloride, observe color. 4. Effervescence due to release of CO_2 gas. 5. Solid at room temperature. 6. Formation of white precipitate. 7. Tartaric acid reduces silver ions to metallic silver forming a mirror.