Chemistry Grade 10 — Chapter 10

Hydroxy Compounds

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Independent practice MCQs from the supplied Class 10 Chemistry notes pack. Total: 50 questions.

A. Important / Main Topics

1. What is the optimal temperature range for the fermentation of glucose to produce ethanol?

(A) 25-35°C
(B) 0-10°C
(C) 50-60°C
(D) 70-80°C

Correct Answer: A

Explanation: The optimal temperature range for fermentation is 25-35°C.

2. Which organism is used in the fermentation process to produce ethanol?

(A) Bacteria
(B) Yeast
(C) Algae
(D) Molds

Correct Answer: B

Explanation: Yeast is used in the fermentation process to produce ethanol.

3. What is the catalyst used in the catalytic hydration of ethene to ethanol?

(A) Sulfuric acid
(B) Hydrochloric acid
(C) Phosphoric acid
(D) Nitric acid

Correct Answer: C

Explanation: Phosphoric acid is used as a catalyst in the catalytic hydration of ethene.

4. What is the primary by-product of ethanol fermentation?

(A) Methane
(B) Oxygen
(C) Water
(D) Carbon dioxide

Correct Answer: D

Explanation: Carbon dioxide is the primary by-product of ethanol fermentation.

5. Which of the following is a major advantage of using ethanol as a fuel?

(A) Clean burning
(B) High cost
(C) Non-renewable
(D) Low energy density

Correct Answer: A

Explanation: Clean burning — this correctly answers the question.

6. What is the chemical formula for ethanol?

(A) CH□OH
(B) CH□CH□OH
(C) C□H□
(D) CH□OCH□

Correct Answer: B

Explanation: The chemical formula for ethanol is CH□CH□OH.

7. Which process requires high pressure and temperature for ethanol production?

(A) Fermentation
(B) Distillation
(C) Catalytic hydration
(D) Sublimation

Correct Answer: C

Explanation: Catalytic hydration — this correctly answers the question.

8. Ethanol combustion primarily produces:

(A) CO and H□O
(B) CO□ and H□
(C) CO and H□
(D) CO□ and H□O

Correct Answer: D

Explanation: Ethanol combustion primarily produces CO□ and H□O.

9. What is the disadvantage of ethanol production through fermentation?

(A) Slow process
(B) High-temperature requirement
(C) High-pressure requirement
(D) Uses non-renewable resources

Correct Answer: A

Explanation: Slow process — this correctly answers the question.

10. Which industry uses alcohol extensively as a solvent?

(A) Agriculture
(B) Pharmaceuticals
(C) Mining
(D) Construction

Correct Answer: B

Explanation: The pharmaceutical industry uses alcohol extensively as a solvent.

11. Which of the following is NOT a use of ethanol in the pharmaceutical industry?

(A) As a solvent
(B) As a disinfectant
(C) As a fuel
(D) As an antiseptic

Correct Answer: C

Explanation: Ethanol is not used as a fuel in the pharmaceutical industry.

12. Which of the following is a disadvantage of using ethanol as a fuel?

(A) It is renewable
(B) It has a high octane number
(C) It reduces carbon monoxide emissions
(D) It can corrode engine materials

Correct Answer: D

Explanation: Ethanol can corrode engine materials due to its hygroscopic nature.

13. What is the role of ethanol in the production of herbal extracts?

(A) It acts as a solvent
(B) It acts as a catalyst
(C) It acts as a reactant
(D) It acts as a product

Correct Answer: A

Explanation: Ethanol acts as a solvent in the production of herbal extracts.

14. Which of the following is NOT a property of ethanol that makes it useful in cosmetics?

(A) Antibacterial
(B) Corrosive
(C) Antiviral
(D) Antifungal

Correct Answer: B

Explanation: Ethanol is not corrosive; it is antibacterial, antiviral, and antifungal.

15. Which of the following is a major advantage of using ethanol as a fuel?

(A) It is non-renewable
(B) It produces more pollutants
(C) It is renewable
(D) It has a low octane number

Correct Answer: C

Explanation: It is renewable — this correctly answers the question.

16. Which of the following is an example of a primary alcohol?

(A) Propan-2-ol
(B) Butan-2-ol
(C) Butan-2-ol
(D) Propan-1-ol

Correct Answer: D

Explanation: Propan-1-ol — this correctly answers the question.

17. Which of the following is an example of a secondary alcohol?

(A) Propan-2-ol
(B) Propan-1-ol
(C) Butan-1-ol
(D) Butan-1-ol

Correct Answer: A

Explanation: Propan-2-ol — this correctly answers the question.

18. What is the product of the combustion of ethanol?

(A) CO□ and H□
(B) CO□ and H□O
(C) CO and H□O
(D) CO and H□

Correct Answer: B

Explanation: CO□ and H□O — this correctly answers the question.

19. Which of the following is a disadvantage of using alcohols as fuel?

(A) They are renewable
(B) They have a high octane number
(C) They are hygroscopic
(D) They reduce emissions

Correct Answer: C

Explanation: Alcohols are hygroscopic, which is a disadvantage.

20. Which of the following is NOT a role of alcohols in the cosmetic industry?

(A) Antibacterial
(B) Antiviral
(C) Antifungal
(D) Antiseptic

Correct Answer: D

Explanation: Alcohols are used as antiseptics, but this is not the only role.

21. Explain why ethanol is considered a renewable fuel.

(A) It is produced from plants
(B) It is produced from crude oil
(C) It is produced from coal
(D) It is produced from natural gas

Correct Answer: A

Explanation: Ethanol is considered a renewable fuel because it is produced from plants such as sugar cane.

22. Describe how ethanol is used in the pharmaceutical industry.

(A) As a fuel
(B) As a solvent
(C) As a lubricant
(D) As a colouring agent

Correct Answer: B

Explanation: Ethanol is used in the pharmaceutical industry as a solvent.

23. What is the role of alcohols in the cosmetic industry?

(A) They act as preservatives
(B) They act as colouring agents
(C) They act as antibacterial agents
(D) They act as fragrances

Correct Answer: C

Explanation: Alcohols act as antibacterial agents in cosmetics.

24. Explain the combustion of ethanol. Write the balanced chemical equation.

(A) CH□CH□OH + 2O□ → 2CO□ + 3H□O + heat
(B) CH□CH□OH + O□ → CO□ + H□O + heat
(C) CH□CH□OH + 4O□ → 2CO□ + 3H□O + heat
(D) CH□CH□OH + 3O□ → 2CO□ + 3H□O + heat

Correct Answer: D

Explanation: "CH□CH□OH + 3O□ → 2CO□ + 3H□O + heat" is correct: it matches the idea asked in the question ("Explain the combustion of ethanol. Write the balanced chemical equation"), while the other choices do not.

25. List two advantages and two disadvantages of using ethanol as a fuel.

(A) Advantages: renewable, reduces emissions; Disadvantages: corrosive, hygroscopic
(B) Advantages: non-renewable, high cost; Disadvantages: clean, renewable
(C) Advantages: renewable, high cost; Disadvantages: corrosive, hygroscopic
(D) Advantages: renewable, reduces emissions; Disadvantages: non-renewable, high cost

Correct Answer: A

Explanation: Ethanol is renewable and reduces emissions, but it is corrosive and hygroscopic.

B. Less Important / Secondary Topics

26. Compare the advantages and disadvantages of fermentation and catalytic hydration for ethanol production.

(A) Fermentation: renewable, slow; Hydration: non-renewable, fast
(B) Fermentation: non-renewable, slow; Hydration: renewable, fast
(C) Fermentation: renewable, fast; Hydration: non-renewable, slow
(D) Fermentation: non-renewable, fast; Hydration: renewable, slow

Correct Answer: A

Explanation: Fermentation uses renewable resources and is slow; hydration uses non-renewable resources and is fast.

27. Explain the role of ethanol in the pharmaceutical industry.

(A) As a fuel
(B) As a solvent and disinfectant
(C) As a lubricant
(D) As a colouring agent

Correct Answer: B

Explanation: Ethanol is used in the pharmaceutical industry as a solvent and disinfectant.

28. Explain the role of ethanol in the cosmetic industry.

(A) As a fragrance
(B) As a colouring agent
(C) As an antibacterial and antifungal agent
(D) As a preservative

Correct Answer: C

Explanation: Ethanol is used in the cosmetic industry as an antibacterial and antifungal agent.

29. Evaluate the environmental impact of the two ethanol production methods.

(A) Fermentation: higher impact; Hydration: lower impact
(B) Fermentation: no impact; Hydration: high impact
(C) Fermentation: high impact; Hydration: no impact
(D) Fermentation: lower impact; Hydration: higher impact

Correct Answer: D

Explanation: Fermentation uses renewable resources and has a lower environmental impact; hydration uses non-renewable resources and has a higher environmental impact.

30. Explain why alcohols are considered cleaner fuels compared to fossil fuels.

(A) They produce fewer harmful emissions
(B) They produce more harmful emissions
(C) They are non-renewable
(D) They are more expensive

Correct Answer: A

Explanation: "They produce fewer harmful emissions" is correct: it matches the idea asked in the question ("Explain why alcohols are considered cleaner fuels compared to fossil fuels"), while the other choices do not.

31. Compare the advantages and disadvantages of the two methods of ethanol production in terms of energy efficiency, cost, and environmental impact.

(A) Fermentation: high energy, high cost, high impact; Hydration: low energy, low cost, low impact
(B) Fermentation: low energy, low cost, low impact; Hydration: high energy, high cost, high impact
(C) Fermentation: low energy, high cost, high impact; Hydration: high energy, low cost, low impact
(D) Fermentation: high energy, low cost, low impact; Hydration: low energy, high cost, high impact

Correct Answer: B

Explanation: "Fermentation: low energy, low cost, low impact; Hydration: high energy, high cost, high impact" is correct: it matches the idea asked in the question ("Compare the advantages and disadvantages of the two methods of ethanol production in terms of energy efficiency, cost, and environmental impact"), while the other choices do not.

32. Analyse the impact of replacing traditional fossil fuels with alcohol-based fuels in terms of emissions and energy efficiency.

(A) Higher emissions, higher energy efficiency
(B) Lower emissions, higher energy efficiency
(C) Lower emissions, lower energy efficiency
(D) Higher emissions, lower energy efficiency

Correct Answer: C

Explanation: "Lower emissions, lower energy efficiency" is correct: it matches the idea asked in the question ("Analyse the impact of replacing traditional fossil fuels with alcohol-based fuels in terms of emissions and energy efficiency"), while the other choices do not.

33. What is the main component of vinegar?

(A) Ethanol
(B) Methanol
(C) Propanoic acid
(D) Ethanoic acid

Correct Answer: D

Explanation: Ethanoic acid is the main component of vinegar.

34. What gas is produced when a carboxylic acid reacts with a metal?

(A) Hydrogen
(B) Oxygen
(C) Carbon dioxide
(D) Nitrogen

Correct Answer: A

Explanation: Hydrogen gas is produced when a carboxylic acid reacts with a metal.

35. Which compound is formed by the bacterial oxidation of ethanol?

(A) Methanoic acid
(B) Ethanoic acid
(C) Propanoic acid
(D) Butanoic acid

Correct Answer: B

Explanation: Ethanoic acid — this correctly answers the question.

36. What type of bond is formed between a carboxylic acid and an alcohol during esterification?

(A) Ionic bond
(B) Hydrogen bond
(C) Covalent bond
(D) Metallic bond

Correct Answer: C

Explanation: A covalent bond is formed between a carboxylic acid and an alcohol during esterification.

37. Which of the following is an example of a carboxylic acid?

(A) Ethanol
(B) Ethyl acetate
(C) Methanol
(D) Ethanoic acid

Correct Answer: D

Explanation: Ethanoic acid — this correctly answers the question.

38. In the oxidation of ethanol to ethanoic acid, what is the role of potassium manganate(VII)?

(A) Oxidizing agent
(B) Reducing agent
(C) Catalyst
(D) Inhibitor

Correct Answer: A

Explanation: Potassium manganate(VII) acts as an oxidizing agent.

39. What is produced when ethanoic acid reacts with sodium hydroxide?

(A) Sodium chloride
(B) Sodium ethanoate
(C) Sodium oxide
(D) Sodium bicarbonate

Correct Answer: B

Explanation: Sodium ethanoate — this correctly answers the question.

40. Which of the following is an ester?

(A) Ethanoic acid
(B) Ethanol
(C) Ethyl ethanoate
(D) Ethanal

Correct Answer: C

Explanation: Ethyl ethanoate — this correctly answers the question.

41. Write the balanced chemical equation for the reaction between ethanoic acid and sodium.

(A) CH□COOH + Na → CH□COONa + H□
(B) CH□COOH + 2Na → CH□COONa + H□
(C) 2CH□COOH + Na → 2CH□COONa + H□
(D) 2CH□COOH + 2Na → 2CH□COONa + H□

Correct Answer: D

Explanation: "2CH□COOH + 2Na → 2CH□COONa + H□" is correct: it matches the idea asked in the question ("Write the balanced chemical equation for the reaction between ethanoic acid and sodium"), while the other choices do not.

42. Describe how ethanoic acid can be formed from ethanol using an oxidizing agent.

(A) Ethanol is oxidized to ethanal, then to ethanoic acid
(B) Ethanol is reduced to ethanal, then to ethanoic acid
(C) Ethanol is oxidized to ethane, then to ethanoic acid
(D) Ethanol is reduced to ethane, then to ethanoic acid

Correct Answer: A

Explanation: Ethanol is oxidized to ethanal, which is further oxidized to ethanoic acid.

43. What is the role of sulfuric acid in the esterification process?

(A) It acts as a reactant
(B) It acts as a catalyst
(C) It acts as a solvent
(D) It acts as a product

Correct Answer: B

Explanation: Sulfuric acid acts as a catalyst in the esterification process.

44. Name the salt formed when ethanoic acid reacts with sodium carbonate.

(A) Sodium chloride
(B) Sodium oxide
(C) Sodium ethanoate
(D) Sodium bicarbonate

Correct Answer: C

Explanation: "Sodium ethanoate" is correct: it matches the idea asked in the question ("Name the salt formed when ethanoic acid reacts with sodium carbonate"), while the other choices do not.

45. Write the chemical equation for the esterification reaction between methanol and ethanoic acid.

(A) CH□COOH + CH□OH → CH□COOCH□
(B) CH□COOH + CH□OH → CH□COOCH□ + H□
(C) CH□COOH + CH□OH → CH□COOCH□ + O□
(D) CH□COOH + CH□OH → CH□COOCH□ + H□O

Correct Answer: D

Explanation: "CH□COOH + CH□OH → CH□COOCH□ + H□O" is correct: it matches the idea asked in the question ("Write the chemical equation for the esterification reaction between methanol and ethanoic acid"), while the other choices do not.

46. What is the main component of vinegar? Give two uses of vinegar in everyday life.

(A) Ethanoic acid; pickles and flavouring food
(B) Ethanol; fuel and disinfectant
(C) Methanoic acid; preservative and flavouring

(D) Propanoic acid; pickles and flavouring

Correct Answer: A

Explanation: The main component of vinegar is ethanoic acid. It is used to make pickles and for flavouring food.

47. Explain why lemon juice is used to reduce the smell of fish.

(A) It contains ethanoic acid
(B) It contains ascorbic acid
(C) It contains citric acid
(D) It contains benzoic acid

Correct Answer: B

Explanation: Lemon juice contains ascorbic acid, which is used to reduce the smell of fish.

48. What is the role of benzoic acid and sodium benzoate in food preservation?

(A) They enhance the flavour of food
(B) They add colour to food
(C) They inhibit the growth of bacteria and fungi
(D) They increase the nutritional value of food

Correct Answer: C

Explanation: Benzoic acid and sodium benzoate are used as preservatives to inhibit the growth of bacteria and fungi.

49. Explain the use of esters in the fragrance industry.

(A) They have sour smells
(B) They have bitter tastes
(C) They have salty tastes
(D) They have pleasant, fruity smells

Correct Answer: D

Explanation: Esters have pleasant, fruity smells and are used in the fragrance industry.

50. What is the use of aspirin? What type of compound is aspirin?

(A) Fever reducer and pain killer; ester
(B) Fever reducer and pain killer; carboxylic acid
(C) Antiseptic; ester
(D) Antiseptic; carboxylic acid

Correct Answer: A

Explanation: Aspirin is used as a fever reducer and pain killer. It is an ester.