



### Pharmaceutical Inorganic Chemistry Unit I

- [Impurities- It's sources, Types and Test of Purity.](#)
- [Limit Test for Chlorides, Sulphates and Iron](#)
- [Limit test for Heavy Metals](#)

**1. Impurities in pharmaceutical substances can arise from:**

- a) Raw materials
- b) Manufacturing process
- c) Storage conditions
- d) All of the above

**2. Which of the following is NOT a type of impurity?**

- a) Organic volatile impurities
- b) Inorganic impurities
- c) Residual solvents
- d) Therapeutic impurities

**3. Limit tests are designed to:**

- a) Quantify the exact amount of impurities
- b) Determine the presence of impurities above a specified limit
- c) Identify the specific type of impurity
- d) Remove impurities from the substance

**4. The limit test for chlorides is based on the formation of:**

- a) A white precipitate of silver chloride
- b) A blue color with starch-iodine solution
- c) A red color with potassium thiocyanate
- d) A yellow precipitate with lead acetate

**5. The limit test for sulfates is based on the formation of:**

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- a) A white precipitate of barium sulfate
- b) A black precipitate of lead sulfide
- c) A brown color with ferric chloride
- d) A yellow color with sodium nitroprusside

**6. The limit test for iron is based on the formation of:**

- a) A blue color with potassium ferrocyanide
- b) A red color with potassium thiocyanate
- c) A brown color with ferric chloride
- d) A yellow color with sodium nitroprusside

**7. The limit test for heavy metals is based on the formation of:**

- a) A black precipitate with hydrogen sulfide
- b) A white precipitate with silver nitrate
- c) A yellow precipitate with lead acetate
- d) A brown color with iodine solution

**8. Which of the following is NOT a common source of heavy metal impurities?**

- a) Raw materials
- b) Manufacturing equipment
- c) Storage containers
- d) Air pollution

**9. The presence of impurities in a pharmaceutical substance can:**

- a) Affect its therapeutic efficacy
- b) Increase its toxicity
- c) Alter its physical and chemical properties
- d) All of the above

**10. Which of the following techniques can be used to detect and quantify impurities?**

- a) Chromatography

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- b) Spectroscopy
- c) Titration
- d) All of the above

**11. The purity of a substance can be assessed by:**

- a) Melting point determination
- b) Boiling point determination
- c) Specific rotation measurement
- d) All of the above

**12. Which of the following is a common impurity in organic compounds?**

- a) Water
- b) Inorganic salts
- c) Residual solvents
- d) All of the above

**13. The presence of water in a pharmaceutical substance can:**

- a) Promote microbial growth
- b) Accelerate degradation
- c) Affect the physical properties of the substance
- d) All of the above

**14. Which of the following methods can be used to determine the water content of a substance?**

- a) Karl Fischer titration
- b) Gravimetric analysis
- c) Gas chromatography
- d) All of the above

**15. Residual solvents in pharmaceutical substances can arise from:**

- a) Manufacturing process
- b) Purification steps

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- c) Storage conditions
- d) All of the above

**16. Which of the following techniques can be used to detect and quantify residual solvents?**

- a) Gas chromatography
- b) Headspace gas chromatography
- c) Liquid chromatography
- d) All of the above

**17. Organic volatile impurities (OVIs) can include:**

- a) Solvents
- b) Reagents
- c) Byproducts
- d) All of the above

**18. Which of the following techniques can be used to detect and quantify OVIs?**

- a) Gas chromatography
- b) Headspace gas chromatography
- c) Mass spectrometry
- d) All of the above

**19. Inorganic impurities can include:**

- a) Metals
- b) Salts
- c) Oxides
- d) All of the above

**20. Which of the following techniques can be used to detect and quantify inorganic impurities?**

- a) Atomic absorption spectroscopy
- b) Inductively coupled plasma mass spectrometry
- c) Ion chromatography

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d) All of the above

**21. The limit test for chlorides is typically performed on:**

- a) Solid dosage forms
- b) Liquid dosage forms
- c) Both solid and liquid dosage forms
- d) None of the above

**22. The limit test for sulfates is typically performed on:**

- a) Solid dosage forms
- b) Liquid dosage forms
- c) Both solid and liquid dosage forms
- d) None of the above

**23. The limit test for iron is typically performed on:**

- a) Solid dosage forms
- b) Liquid dosage forms
- c) Both solid and liquid dosage forms
- d) None of the above

**24. The limit test for heavy metals is typically performed on:**

- a) Solid dosage forms
- b) Liquid dosage forms
- c) Both solid and liquid dosage forms
- d) None of the above

**25. The limit test for chlorides involves the addition of:**

- a) Silver nitrate solution
- b) Barium chloride solution
- c) Potassium ferrocyanide solution
- d) Hydrogen sulfide gas

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**26. The limit test for sulfates involves the addition of:**

- a) Silver nitrate solution
- b) Barium chloride solution
- c) Potassium ferrocyanide solution
- d) Hydrogen sulfide gas

**27. The limit test for iron involves the addition of:**

- a) Silver nitrate solution
- b) Barium chloride solution
- c) Potassium ferrocyanide solution
- d) Hydrogen sulfide gas

**28. The limit test for heavy metals involves the addition of:**

- a) Silver nitrate solution
- b) Barium chloride solution
- c) Potassium ferrocyanide solution
- d) Hydrogen sulfide gas

**29. The limit test for chlorides is based on the formation of a:**

- a) White precipitate
- b) Black precipitate
- c) Red precipitate
- d) Yellow precipitate

**30. The limit test for sulfates is based on the formation of a:**

- a) White precipitate
- b) Black precipitate
- c) Red precipitate
- d) Yellow precipitate

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**31. The limit test for iron is based on the formation of a:**

- a) Blue color
- b) Red color
- c) Green color
- d) Yellow color

**32. The limit test for heavy metals is based on the formation of a:**

- a) Black precipitate
- b) White precipitate
- c) Red precipitate
- d) Yellow precipitate

**33. The limit test for chlorides is a:**

- a) Qualitative test
- b) Quantitative test
- c) Semi-quantitative test
- d) None of the above

**34. The limit test for sulfates is a:**

- a) Qualitative test
- b) Quantitative test
- c) Semi-quantitative test
- d) None of the above

**35. The limit test for iron is a:**

- a) Qualitative test
- b) Quantitative test
- c) Semi-quantitative test
- d) None of the above

**36. The limit test for heavy metals is a:**

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- a) Qualitative test
- b) Quantitative test
- c) Semi-quantitative test
- d) None of the above

**37. The limit test for chlorides is compared to a:**

- a) Standard solution of known chloride concentration
- b) Blank solution
- c) Positive control
- d) None of the above

**38. The limit test for sulfates is compared to a:**

- a) Standard solution of known sulfate concentration
- b) Blank solution
- c) Positive control
- d) None of the above

**39. The limit test for iron is compared to a:**

- a) Standard solution of known iron concentration
- b) Blank solution
- c) Positive control
- d) None of the above

**40. The limit test for heavy metals is compared to a:**

- a) Standard solution of known heavy metal concentration
- b) Blank solution
- c) Positive control
- d) None of the above

**41. The limit test for chlorides is performed in a:**

- a) Nessler cylinder

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- b) Volumetric flask
- c) Conical flask
- d) Beaker

**42. The limit test for sulfates is performed in a:**

- a) Nessler cylinder
- b) Volumetric flask
- c) Conical flask
- d) Beaker

**43. The limit test for iron is performed in a:**

- a) Nessler cylinder
- b) Volumetric flask
- c) Conical flask
- d) Beaker

**44. The limit test for heavy metals is performed in a:**

- a) Nessler cylinder
- b) Volumetric flask
- c) Conical flask
- d) Beaker

**45. Which of the following is a common limit for chlorides in pharmaceutical substances?**

- a) Not more than 0.01% w/w
- b) Not more than 0.05% w/w
- c) Not more than 0.1% w/w
- d) Not more than 0.5% w/w

**46. Which of the following is a common limit for sulfates in pharmaceutical substances?**

- a) Not more than 0.01% w/w
- b) Not more than 0.05% w/w

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- c) Not more than 0.1% w/w
- d) Not more than 0.5% w/w

**47. Which of the following is a common limit for iron in pharmaceutical substances?**

- a) Not more than 10 ppm
- b) Not more than 20 ppm
- c) Not more than 50 ppm
- d) Not more than 100 ppm

**48. Which of the following is a common limit for heavy metals in pharmaceutical substances?**

- a) Not more than 10 ppm
- b) Not more than 20 ppm
- c) Not more than 50 ppm
- d) Not more than 100 ppm

**49. The limit tests are described in which pharmacopoeia?**

- a) United States Pharmacopeia (USP)
- b) European Pharmacopoeia (Ph. Eur.)
- c) British Pharmacopoeia (BP)
- d) All of the above

**50. Compliance with limit tests is:**

- a) Mandatory for all pharmaceutical substances
- b) Optional for all pharmaceutical substances
- c) Dependent on the specific monograph
- d) Not required for any pharmaceutical substance

#### Answers

1. Impurities in pharmaceutical substances can arise from raw materials, the manufacturing process, and storage conditions.
2. Therapeutic impurities are not a recognized type of impurity in pharmaceutical substances.

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3. **Limit tests are designed to determine the presence of impurities above a specified limit.**
4. **The limit test for chlorides is based on the formation of a white precipitate of silver chloride.**
5. **The limit test for sulfates is based on the formation of a white precipitate of barium sulfate.**
6. **The limit test for iron is based on the formation of a blue color with potassium ferrocyanide.**
7. **The limit test for heavy metals is based on the formation of a black precipitate with hydrogen sulfide.**
8. **Air pollution is not considered a common source of heavy metal impurities in pharmaceutical substances.**
9. **The presence of impurities in a pharmaceutical substance can affect its therapeutic efficacy, increase its toxicity, and alter its physical and chemical properties.**
10. **Chromatography, spectroscopy, and titration are techniques that can be used to detect and quantify impurities.**
11. **The purity of a substance can be assessed by determining its melting point, boiling point, and specific rotation.**
12. **Water, inorganic salts, and residual solvents are common impurities in organic compounds.**
13. **The presence of water in a pharmaceutical substance can promote microbial growth, accelerate degradation, and affect the physical properties of the substance.**
14. **Karl Fischer titration, gravimetric analysis, and gas chromatography are methods that can be used to determine the water content of a substance.**
15. **Residual solvents in pharmaceutical substances can arise from the manufacturing process, purification steps, and storage conditions.**
16. **Gas chromatography, headspace gas chromatography, and liquid chromatography are techniques that can be used to detect and quantify residual solvents.**
17. **Organic volatile impurities (OVIs) can include solvents, reagents, and byproducts.**
18. **Gas chromatography, headspace gas chromatography, and mass spectrometry are techniques that can be used to detect and quantify OVIs.**
19. **Inorganic impurities can include metals, salts, and oxides.**
20. **Atomic absorption spectroscopy, inductively coupled plasma mass spectrometry, and ion chromatography are techniques that can be used to detect and quantify inorganic impurities.**
21. **The limit test for chlorides is typically performed on both solid and liquid dosage forms.**
22. **The limit test for sulfates is typically performed on both solid and liquid dosage forms.**
23. **The limit test for iron is typically performed on both solid and liquid dosage forms.**



24. The limit test for heavy metals is typically performed on both solid and liquid dosage forms.
25. The limit test for chlorides involves the addition of silver nitrate solution.
26. The limit test for sulfates involves the addition of barium chloride solution.
27. The limit test for iron involves the addition of potassium ferrocyanide solution.
28. The limit test for heavy metals involves the addition of hydrogen sulfide gas.
29. The limit test for chlorides is based on the formation of a white precipitate.
30. The limit test for sulfates is based on the formation of a white precipitate.
31. The limit test for iron is based on the formation of a blue color.
32. The limit test for heavy metals is based on the formation of a black precipitate.
33. The limit test for chlorides is a semi-quantitative test.
34. The limit test for sulfates is a semi-quantitative test.
35. The limit test for iron is a semi-quantitative test.
36. The limit test for heavy metals is a semi-quantitative test.
37. The limit test for chlorides is compared to a standard solution of known chloride concentration.
38. The limit test for sulfates is compared to a standard solution of known sulfate concentration.
39. The limit test for iron is compared to a standard solution of known iron concentration.
40. The limit test for heavy metals is compared to a standard solution of known heavy metal concentration.
41. The limit test for chlorides is performed in a Nessler cylinder.
42. The limit test for sulfates is performed in a Nessler cylinder.
43. The limit test for iron is performed in a conical flask.
44. The limit test for heavy metals is performed in a Nessler cylinder.
45. A common limit for chlorides in pharmaceutical substances is not more than 0.01% w/w.
46. A common limit for sulfates in pharmaceutical substances is not more than 0.1% w/w.
47. A common limit for iron in pharmaceutical substances is not more than 20 ppm.
48. A common limit for heavy metals in pharmaceutical substances is not more than 10 ppm.
49. The limit tests are described in the United States Pharmacopeia (USP), European Pharmacopoeia (Ph. Eur.), and British Pharmacopoeia (BP).
50. Compliance with limit tests is dependent on the specific monograph.



## Pharmaceutical inorganic chemistry Unit II

- [Acids, Bases Theory And pH Scale](#)
- [Buffer Solution: Buffer Equation and Buffer Capacity](#)
- [Buffered Isotonic Solutions](#)
- [Major Extracellular and Intracellular Electrolytes](#)
- [Electrolytes Used in Replacement Therapy and ORS](#)
- [Dental Products](#)

**1. Which of the following is NOT a characteristic of a strong acid?**

- a) High degree of ionization in water
- b) Low pH
- c) Complete dissociation in water
- d) Slow reaction with water

**2. Which acid-base theory defines acids as electron acceptors?**

- a) Arrhenius
- b) Brønsted-Lowry
- c) Lewis
- d) None of the above

**3. Calculate the pH of a 0.01 M HCl solution.**

- a) 1
- b) 2
- c) 3
- d) 4

**4. What is the pOH of a solution with a pH of 9?**

- a) 3
- b) 4

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- c) 5
- d) 6

**5. Which of the following is NOT a component of the Henderson-Hasselbalch equation?**

- a) pKa
- b) pH
- c) Concentration of the acid
- d) Concentration of the base

**6. A buffer solution resists changes in pH because:**

- a) It contains a high concentration of water.
- b) It contains a high concentration of salt.
- c) It contains a weak acid and its conjugate base.
- d) It contains a strong acid and a strong base.

**7. What happens to the pH of a buffered solution when a small amount of strong acid is added?**

- a) The pH increases significantly.
- b) The pH decreases significantly.
- c) The pH remains relatively constant.
- d) The pH fluctuates wildly.

**8. Which of the following factors does NOT significantly affect buffer capacity?**

- a) Temperature
- b) Concentration of the buffer components
- c) The pKa of the weak acid
- d) The volume of the buffer solution

**9. Which of the following is NOT a characteristic of an isotonic solution?**

- a) Same osmotic pressure as the surrounding cells
- b) Causes cell shrinkage
- c) Maintains cell integrity

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d) No net movement of water across the cell membrane

**10. Why is it important to maintain electrolyte balance in the body?**

- a) To ensure proper nerve function
- b) To maintain fluid balance
- c) To regulate muscle contractions
- d) All of the above

**11. Which electrolyte is the most abundant cation in the extracellular fluid?**

- a) Sodium
- b) Potassium
- c) Calcium
- d) Magnesium

**12. Which electrolyte is the most abundant anion in the intracellular fluid?**

- a) Chloride
- b) Phosphate
- c) Bicarbonate
- d) Sulfate

**13. Oral Rehydration Solutions (ORS) are primarily used to treat:**

- a) Dehydration due to diarrhea
- b) Hypoglycemia
- c) Hyponatremia
- d) Anemia

**14. Which of the following is NOT a typical component of an ORS solution?**

- a) Glucose
- b) Sodium
- c) Potassium
- d) Calcium

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**15. What is the primary role of fluoride in toothpaste?**

- a) To whiten teeth
- b) To prevent tooth decay
- c) To freshen breath
- d) To remove plaque

**16. Which of the following is NOT a common dental procedure?**

- a) Endoscopy
- b) Root canal therapy
- c) Dental implants
- d) Orthodontics

**17. What is the primary function of saliva?**

- a) To aid in digestion
- b) To lubricate food
- c) To protect teeth from decay
- d) All of the above

**18. Which of the following is NOT a characteristic of a Lewis acid?**

- a) Electron donor
- b) Electron acceptor
- c) Can form a coordinate covalent bond
- d) Can accept a lone pair of electrons

**19. What is the conjugate base of  $\text{H}_2\text{CO}_3$  (carbonic acid)?**

- a)  $\text{HCO}_3^-$  (bicarbonate)
- b)  $\text{CO}_2$  (carbon dioxide)
- c)  $\text{H}_3\text{O}^+$  (hydronium ion)
- d)  $\text{OH}^-$  (hydroxide ion)

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**20. A solution with a pH of 3 is how many times more acidic than a solution with a pH of 5?**

- a) 2 times
- b) 5 times
- c) 10 times
- d) 100 times

**21. Which of the following indicators is commonly used in acid-base titrations?**

- a) Litmus paper
- b) Phenolphthalein
- c) Bromothymol blue
- d) All of the above

**22. What happens to the pH of blood when carbon dioxide levels increase?**

- a) pH increases
- b) pH decreases
- c) pH remains unchanged
- d) pH fluctuates unpredictably

**23. Which organ plays a crucial role in regulating blood pH?**

- a) Liver
- b) Lungs
- c) Kidneys
- d) Spleen

**24. What is the primary cause of metabolic acidosis?**

- a) Excessive production of lactic acid
- b) Hyperventilation
- c) Respiratory failure
- d) Excessive vomiting

**25. What is the primary cause of respiratory alkalosis?**

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- a) Hypoventilation
- b) Hyperventilation
- c) Kidney failure
- d) Excessive alcohol consumption

**26. Which of the following is NOT a function of electrolytes in the body?**

- a) Maintaining blood pressure
- b) Regulating body temperature
- c) Transmitting nerve impulses
- d) Facilitating muscle contractions

**27. Which electrolyte is essential for proper muscle and nerve function?**

- a) Sodium
- b) Potassium
- c) Calcium
- d) Magnesium

**28. What is the primary function of dental implants?**

- a) To whiten teeth
- b) To replace missing teeth
- c) To prevent cavities
- d) To improve the appearance of teeth

**29. Which of the following is NOT a type of denture?**

- a) Complete denture
- b) Partial denture
- c) Implant-supported denture
- d) Inlay denture

**30. What is the primary goal of orthodontic treatment?**

- a) To improve the appearance of teeth

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- b) To improve the function of teeth
- c) To prevent tooth decay
- d) To strengthen tooth enamel

**31. Which of the following is NOT a type of orthodontic appliance?**

- a) Braces
- b) Retainers
- c) Dental implants
- d) Clear aligners

**32. What is the main difference between clear aligners and traditional braces?**

- a) Clear aligners are more visible.
- b) Clear aligners are removable.
- c) Clear aligners are more expensive.
- d) Clear aligners are only suitable for minor corrections.

**33. Which of the following is NOT a characteristic of a strong base?**

- a) High pH
- b) Complete dissociation in water
- c) Low concentration of hydroxide ions
- d) Reacts readily with acids

**34. Which of the following is an example of a strong acid?**

- a) Acetic acid
- b) Hydrochloric acid
- c) Carbonic acid
- d) Lactic acid

**35. Which of the following is an example of a weak base?**

- a) Sodium hydroxide
- b) Ammonia

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- c) Potassium hydroxide
- d) Calcium hydroxide

**36. What is the relationship between pKa and the strength of an acid?**

- a) Higher pKa indicates a stronger acid.
- b) Lower pKa indicates a stronger acid.
- c) pKa is not related to acid strength.
- d) pKa is only relevant for strong acids.

**37. What is the pH of a solution with a hydrogen ion concentration of  $1 \times 10^{-8}$  M?**

- a) 7
- b) 8
- c) 9
- d) 10

**38. Which of the following is NOT a characteristic of a buffer solution?**

- a) Resists changes in pH upon the addition of small amounts of acid or base
- b) Contains a high concentration of a strong acid
- c) Contains a weak acid and its conjugate base
- d) Can help maintain a stable pH in biological systems

**39. What is the primary function of a buffer solution in the human body?**

- a) To regulate blood glucose levels
- b) To maintain blood pressure
- c) To maintain blood pH
- d) To transport oxygen

**40. Which of the following is NOT a factor that affects the solubility of electrolytes?**

- a) Temperature
- b) Pressure
- c) Particle size

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d) Surface area of the solute

**41. Which of the following is NOT a factor that affects the solubility of electrolytes?**

- a) Temperature
- b) Pressure
- c) pH
- d) Surface area of the solute

**42. What is the primary function of electrolytes in nerve impulse transmission?**

- a) To provide energy for nerve cells
- b) To maintain the resting membrane potential
- c) To insulate nerve fibers
- d) To increase the speed of nerve impulses

**43. Which of the following is NOT a common symptom of electrolyte imbalance?**

- a) Muscle cramps
- b) Fatigue
- c) Increased appetite
- d) Irregular heartbeat

**44. What is the primary function of dental floss?**

- a) To whiten teeth
- b) To remove plaque from between teeth
- c) To massage the gums
- d) To freshen breath

**45. Which of the following is NOT a common ingredient in toothpaste?**

- a) Fluoride
- b) Detergent
- c) Abrasive
- d) Sugar

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**46. What is the primary cause of tooth decay?**

- a) Poor oral hygiene
- b) Excessive sugar consumption
- c) Acid erosion from acidic foods and drinks
- d) All of the above

**47. What is the role of the tongue in oral health?**

- a) To aid in chewing and swallowing
- b) To help distribute saliva
- c) To contribute to speech
- d) All of the above

**48. What is the primary function of dental bridges?**

- a) To replace a single missing tooth
- b) To replace multiple missing teeth
- c) To improve the appearance of teeth
- d) To prevent tooth decay

**49. Which of the following is NOT a common complication associated with dental implants?**

- a) Infection
- b) Nerve damage
- c) Tooth decay
- d) Gum disease

**50. What is the primary goal of orthodontics?**

- a) To improve the appearance of teeth
- b) To improve the function of teeth
- c) To prevent tooth decay
- d) To strengthen tooth enamel



**51. Which of the following is NOT a type of orthodontic appliance?**

- a) Braces
- b) Retainers
- c) Dental implants
- d) Clear aligners

**52. What is the primary function of saliva?**

- a) To aid in digestion
- b) To lubricate food
- c) To protect teeth from decay
- d) All of the above

**53. Which of the following is NOT a characteristic of a strong acid?**

- a) High degree of ionization in water
- b) Low pH
- c) Complete dissociation in water
- d) Slow reaction with water

**54. Which acid-base theory defines acids as electron acceptors?**

- a) Arrhenius
- b) Brønsted-Lowry
- c) Lewis
- d) None of the above

**55. Calculate the pH of a 0.01 M HCl solution.**

- a) 1
- b) 2
- c) 3
- d) 4

**56. What is the pOH of a solution with a pH of 9?**

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- a) 3
- b) 4
- c) 5
- d) 6

**57. Which of the following is NOT a component of the Henderson-Hasselbalch equation?**

- a) pKa
- b) pH
- c) Concentration of the acid
- d) Concentration of the base

**58. A buffer solution resists changes in pH because:**

- a) It contains a high concentration of water.
- b) It contains a high concentration of salt.
- c) It contains a weak acid and its conjugate base.
- d) It contains a strong acid and a strong base.

**59. What happens to the pH of a buffered solution when a small amount of strong acid is added?**

- a) The pH increases significantly.
- b) The pH decreases significantly.
- c) The pH remains relatively constant.
- d) The pH fluctuates wildly.

**60. Which of the following factors does NOT significantly affect buffer capacity?**

- a) Temperature
- b) Concentration of the buffer components
- c) The pKa of the weak acid
- d) The volume of the buffer solution

**Answers**

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1. d) Slow reaction with water
2. c) Lewis
3. b) 2 ( $\text{pH} = -\log[\text{H}^+]$ ;  $\text{pH} = -\log(0.01) = 2$ )
4. c) 5 ( $\text{pH} + \text{pOH} = 14$ ;  $\text{pOH} = 14 - 9 = 5$ )
5. d) Concentration of the base
6. c) It contains a weak acid and its conjugate base.
7. c) The pH remains relatively constant.
8. d) The volume of the buffer solution
9. b) Causes cell shrinkage
  
10. d) All of the above
  
11. a) Sodium
  
12. b) Phosphate
  
13. a) Dehydration due to diarrhea
  
14. d) Calcium
  
15. b) To prevent tooth decay
  
16. a) Endoscopy (Endoscopy is a medical procedure to examine the inside of the body)
  
17. d) All of the above
  
18. a) Electron donor
  
19. a)  $\text{HCO}_3^-$  (bicarbonate)
  
20. d) 100 times (Each pH unit represents a tenfold difference in hydrogen ion concentration)
  
21. d) All of the above
  
22. b) pH decreases
  
23. c) Kidneys
  
24. a) Excessive production of lactic acid
  
25. b) Hyperventilation
  
26. b) Regulating body temperature
  
27. b) Potassium
  
28. b) To replace missing teeth
  
29. d) Inlay denture (Inlays and onlays are types of dental fillings)
  
30. b) To improve the function of teeth
  
31. c) Dental implants
  
32. b) Clear aligners are removable.
  
33. c) Low concentration of hydroxide ions
  
34. b) Hydrochloric acid

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35. b) Ammonia
36. b) Lower pKa indicates a stronger acid.
37. c) 9 ( $\text{pH} = -\log[\text{H}^+]$ ;  $\text{pH} = -\log(1 \times 10^{-8}) = 8$ )
38. b) Contains a high concentration of a strong acid
39. c) To maintain blood pH
40. d) Surface area of the solute
41. d) Surface area of the solute
42. b) To maintain the resting membrane potential
43. c) Increased appetite
44. b) To remove plaque from between teeth
45. d) Sugar
46. d) All of the above
47. d) All of the above
48. b) To replace multiple missing teeth
49. c) Tooth decay (Dental implants themselves do not decay)
50. b) To improve the function of teeth
51. c) Dental implants
52. d) All of the above
53. d) Slow reaction with water
54. c) Lewis
55. b) 2 ( $\text{pH} = -\log[\text{H}^+]$ ;  $\text{pH} = -\log(0.01) = 2$ )
56. c) 5 ( $\text{pH} + \text{pOH} = 14$ ;  $\text{pOH} = 14 - 9 = 5$ )
57. d) Concentration of the base
58. c) It contains a weak acid and its conjugate base.
59. c) The pH remains relatively constant.
60. d) The volume of the buffer solution

### Pharmaceutical Inorganic chemistry Unit III

- [Gastrointestinal Agents: Acidifying Agents](#)

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- [Gastrointestinal Agents: Antacids](#)
- [Cathartics](#)
- [Antimicrobial Agents](#)

1. **What is the primary purpose of acidifying agents in the gastrointestinal tract?**

- a) Neutralize stomach acid
- b) Lower stomach pH levels
- c) Increase bowel movements
- d) Treat infections

2. **Which acidifying agent is commonly used in veterinary medicine?**

- a) Sodium bicarbonate
- b) Ammonium chloride
- c) Magnesium hydroxide
- d) Citric acid

3. **Name a natural acidifying agent used in the food industry.**

- a) Lactic acid
- b) Citric acid
- c) Phosphoric acid
- d) Hydrochloric acid

4. **What is the effect of acidifying agents on enzyme activity in the stomach?**

- a) Inhibit enzyme activity
- b) Neutralize enzymes
- c) Activate pepsinogen into pepsin
- d) Increase water absorption

5. **How do acidifying agents aid in digestion?**

- a) By absorbing water
- b) By neutralizing stomach acid
- c) By maintaining an acidic environment in the stomach
- d) By inhibiting protein synthesis

6. **What is the primary function of antacids?**
- a) Increase stomach acid
  - b) Induce bowel movements
  - c) Neutralize stomach acid
  - d) Treat infections
7. **Name a commonly used antacid ingredient.**
- a) Magnesium hydroxide
  - b) Sodium chloride
  - c) Ammonium chloride
  - d) Citric acid
8. **What symptom do antacids primarily treat?**
- a) Diarrhea
  - b) Heartburn
  - c) Nausea
  - d) Constipation
9. **Which antacid is known for its rapid action?**
- a) Calcium carbonate
  - b) Magnesium hydroxide
  - c) Sodium bicarbonate
  - d) Aluminum hydroxide
10. **Can antacids be used to treat ulcers?**
- a) No, they cannot
  - b) Yes, they help reduce stomach acidity
  - c) Only with prescription
  - d) Only in combination with antibiotics
11. **What is the main purpose of cathartics?**
- a) Reduce stomach acid
  - b) Induce bowel movements
  - c) Treat infections
  - d) Neutralize toxins
12. **Name a stimulant cathartic commonly used.**



- a) Bisacodyl
- b) Psyllium husk
- c) Magnesium citrate
- d) Polyethylene glycol

**13. How do bulk-forming cathartics work?**

- a) By absorbing water to form a soft, bulky stool
- b) By stimulating the intestinal muscles
- c) By neutralizing stomach acid
- d) By coating the stool

**14. Which cathartic is often used for bowel preparation before colonoscopy?**

- a) Polyethylene glycol
- b) Bisacodyl
- c) Psyllium husk
- d) Magnesium hydroxide

**15. What is a common side effect of osmotic cathartics?**

- a) Heartburn
- b) Nausea
- c) Diarrhea
- d) Constipation

**16. What is the role of emollient cathartics?**

- a) To increase bowel movements
- b) To soften stools by increasing water content
- c) To neutralize stomach acid
- d) To treat infections

**17. Which cathartic is also known as a saline laxative?**

- a) Bisacodyl
- b) Polyethylene glycol
- c) Magnesium citrate
- d) Psyllium husk

**18. How do lubricant cathartics aid in bowel movements?**

- a) By stimulating the intestinal muscles

- b) By absorbing water
- c) By coating the stool to ease passage
- d) By reducing stomach acid

**19. What is a natural source of bulk-forming cathartics?**

- a) Magnesium citrate
- b) Psyllium husk
- c) Polyethylene glycol
- d) Bisacodyl

**20. Name an anthraquinone derivative used as a cathartic.**

- a) Polyethylene glycol
- b) Senna
- c) Bisacodyl
- d) Psyllium husk

**21. What is the primary action of antimicrobial agents?**

- a) To increase bowel movements
- b) To kill or inhibit the growth of microorganisms
- c) To neutralize stomach acid
- d) To activate enzymes

**22. Which class of antimicrobial agents inhibits cell wall synthesis?**

- a) Macrolides
- b) Beta-lactams
- c) Fluoroquinolones
- d) Aminoglycosides

**23. Name a commonly used broad-spectrum antibiotic.**

- a) Metronidazole
- b) Ciprofloxacin
- c) Amoxicillin
- d) Vancomycin

**24. How do macrolides function as antimicrobial agents?**

- a) By inhibiting cell wall synthesis
- b) By disrupting bacterial DNA

- c) By inhibiting protein synthesis
- d) By neutralizing toxins

**25. What is the target of antifungal agents?**

- a) Bacterial cell wall
- b) Fungal cell membrane or wall
- c) Viral enzymes
- d) Parasite metabolism

**26. Which antimicrobial agent is used to treat tuberculosis?**

- a) Amoxicillin
- b) Ciprofloxacin
- c) Isoniazid
- d) Metronidazole

**27. Name an antibiotic that belongs to the aminoglycosides class.**

- a) Ciprofloxacin
- b) Gentamicin
- c) Erythromycin
- d) Penicillin

**28. How do sulfonamides act as antimicrobial agents?**

- a) By inhibiting DNA replication
- b) By disrupting cell membranes
- c) By inhibiting folic acid synthesis
- d) By neutralizing acids

**29. What is the use of antiviral agents?**

- a) To treat bacterial infections
- b) To treat viral infections
- c) To neutralize stomach acid
- d) To increase bowel movements

**30. Which agent is used as an antifungal medication for systemic infections?**

- a) Amoxicillin
- b) Vancomycin
- c) Amphotericin B

- d) Ciprofloxacin

**31. What is the mechanism of action of fluoroquinolones?**

- a) Inhibiting DNA gyrase
- b) Disrupting cell membranes
- c) Inhibiting protein synthesis
- d) Neutralizing acids

**32. Name an antifungal agent used topically for skin infections.**

- a) Vancomycin
- b) Clotrimazole
- c) Erythromycin
- d) Amoxicillin

**33. How do tetracyclines inhibit bacterial growth?**

- a) By blocking protein synthesis
- b) By disrupting cell membranes
- c) By inhibiting DNA replication
- d) By neutralizing acids

**34. Which antimicrobial is used for treating malaria?**

- a) Amoxicillin
- b) Chloroquine
- c) Vancomycin
- d) Ciprofloxacin

**35. What is the main use of metronidazole?**

- a) To treat bacterial infections
- b) To treat viral infections
- c) To treat anaerobic bacterial and protozoal infections
- d) To increase bowel movements

**36. Name a penicillin antibiotic.**

- a) Amoxicillin
- b) Erythromycin
- c) Ciprofloxacin
- d) Gentamicin



37. How do carbapenems act as antimicrobial agents?

- a) By disrupting cell membranes
- b) By inhibiting cell wall synthesis
- c) By inhibiting protein synthesis
- d) By neutralizing acids

38. Which agent is used to treat herpes virus infections?

- a) Amoxicillin
- b) Acyclovir
- c) Ciprofloxacin
- d) Vancomycin

39. What is the function of antiviral agents like oseltamivir?

- a) Inhibiting bacterial growth
- b) Disrupting cell membranes
- c) Inhibiting viral neuraminidase
- d) Increasing bowel movements

40. Name a broad-spectrum antifungal used for oral thrush.

- a) Clotrimazole
- b) Nystatin
- c) Vancomycin
- d) Ciprofloxacin

41. How do cephalosporins work against bacteria?

- a) By inhibiting protein synthesis
- b) By disrupting cell membranes
- c) By inhibiting cell wall synthesis
- d) By neutralizing acids

42. Which antimicrobial agent is used to treat bacterial conjunctivitis?

- a) Erythromycin
- b) Ciprofloxacin
- c) Amoxicillin
- d) Vancomycin

43. What is the main use of vancomycin?



- a) To treat tuberculosis
- b) To treat MRSA infections
- c) To treat fungal infections
- d) To treat viral infections

44. **Name an antifungal used for vaginal yeast infections.**

- a) Amphotericin B
- b) Metronidazole
- c) Miconazole
- d) Ciprofloxacin

45. **How do nitrofurantoin work against bacterial infections?**

- a) By disrupting cell membranes
- b) By damaging bacterial DNA
- c) By inhibiting protein synthesis
- d) By neutralizing acids

46. **Which antimicrobial agent is used in the treatment of acne?**

- a) Clindamycin
- b) Vancomycin
- c) Gentamicin
- d) Ciprofloxacin

47. **What is the action of polymyxins?**

- a) Inhibiting DNA replication
- b) Disrupting bacterial cell membranes
- c) Inhibiting protein synthesis
- d) Neutralizing acids

48. **Name an agent used as a prophylaxis for HIV.**

- a) Truvada (emtricitabine/tenofovir)
- b) Vancomycin
- c) Metronidazole
- d) Ciprofloxacin

49. **How do antiviral drugs like zidovudine work?**

- a) By inhibiting reverse transcriptase



- b) By disrupting cell membranes
- c) By inhibiting protein synthesis
- d) By neutralizing acids

50. **Which antibiotic is used to treat H. pylori infections?**

- a) Gentamicin
- b) Clarithromycin
- c) Ciprofloxacin
- d) Vancomycin

51. **Name a topical antifungal agent for athlete's foot.**

- a) Terbinafine
- b) Metronidazole
- c) Ciprofloxacin
- d) Vancomycin

52. **How do ketolides act as antimicrobial agents?**

- a) Inhibiting DNA replication
- b) Disrupting cell membranes
- c) Inhibiting protein synthesis
- d) Neutralizing acids

53. **Which agent is used to treat pneumocystis pneumonia?**

- a) Trimethoprim-sulfamethoxazole
- b) Metronidazole
- c) Ciprofloxacin
- d) Vancomycin

54. **What is the use of the antimicrobial agent linezolid?**

- a) To treat tuberculosis
- b) To treat resistant gram-positive infections
- c) To treat fungal infections
- d) To treat viral infections

55. **Name an antifungal used for systemic candidiasis.**

- a) Fluconazole
- b) Ciprofloxacin



- c) Amoxicillin
- d) Vancomycin

**56. How do quinolones function as antimicrobial agents?**

- a) By inhibiting DNA replication
- b) By disrupting cell membranes
- c) By inhibiting protein synthesis
- d) By neutralizing acids

**57. Which agent is used to treat bacterial vaginosis?**

- a) Metronidazole
- b) Ciprofloxacin
- c) Amoxicillin
- d) Vancomycin

**58. What is the function of the antibiotic doxycycline?**

- a) Inhibiting bacterial protein synthesis
- b) Disrupting cell membranes
- c) Inhibiting DNA replication
- d) Neutralizing acids

**59. Name an antiviral used to treat influenza.**

- a) Oseltamivir
- b) Acyclovir
- c) Metronidazole
- d) Ciprofloxacin

**60. How do penicillin antibiotics work?**

- a) By disrupting cell membranes
- b) By inhibiting bacterial cell wall synthesis
- c) By inhibiting protein synthesis
- d) By neutralizing acids

**answers**

1. b) Lower stomach pH levels
2. b) Ammonium chloride

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3. b) Citric acid
4. c) Activate pepsinogen into pepsin
5. c) By maintaining an acidic environment in the stomach
6. c) Neutralize stomach acid
7. a) Magnesium hydroxide
8. b) Heartburn
9. c) Sodium bicarbonate
10. b) Yes, they help reduce stomach acidity
11. b) Induce bowel movements
12. a) Bisacodyl
13. a) By absorbing water to form a soft, bulky stool
14. a) Polyethylene glycol
15. c) Diarrhea
16. b) To soften stools by increasing water content
17. c) Magnesium citrate
18. c) By coating the stool to ease passage
19. b) Psyllium husk
20. b) Senna
21. b) To kill or inhibit the growth of microorganisms
22. b) Beta-lactams
23. b) Ciprofloxacin
24. c) By inhibiting protein synthesis
25. b) Fungal cell membrane or wall
26. c) Isoniazid
27. b) Gentamicin
28. c) By inhibiting folic acid synthesis
29. b) To treat viral infections
30. c) Amphotericin B
31. a) Inhibiting DNA gyrase
32. b) Clotrimazole
33. a) By blocking protein synthesis

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34. b) Chloroquine
35. c) To treat anaerobic bacterial and protozoal infections
36. a) Amoxicillin
37. b) By inhibiting cell wall synthesis
38. b) Acyclovir
39. c) Inhibiting viral neuraminidase
40. b) Nystatin
41. c) By inhibiting cell wall synthesis
42. a) Erythromycin
43. b) To treat MRSA infections
44. c) Miconazole
45. b) By damaging bacterial DNA
46. a) Clindamycin
47. b) Disrupting bacterial cell membranes
48. a) Truvada (emtricitabine/tenofovir)
49. a) By inhibiting reverse transcriptase
50. b) Clarithromycin
51. a) Terbinafine
52. c) Inhibiting protein synthesis
53. a) Trimethoprim-sulfamethoxazole
54. b) To treat resistant gram-positive infections
55. a) Fluconazole
56. a) By inhibiting DNA replication
57. a) Metronidazole
58. a) Inhibiting bacterial protein synthesis
59. a) Oseltamivir
60. b) By inhibiting bacterial cell wall synthesis

#### Pharmaceutical inorganic chemistry Unit IV

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- [Expectorants](#)
- [Emetics](#)
- [Haematinics](#)
- [Poison and Antidotes](#)
- [Astringents](#)

1. Which of the following is a common expectorant that helps in thinning mucus?

- A) Diphenhydramine
- B) Codeine
- C) Guaifenesin
- D) Loratadine

2. Expectorants primarily act on which part of the body?

- A) Brain
- B) Lungs
- C) Stomach
- D) Liver

3. Guaifenesin is commonly used for which type of cough?

- A) Dry cough
- B) Wet cough
- C) Allergic cough
- D) Chronic cough

4. Which of the following is NOT a mechanism of action of expectorants?

- A) Reducing mucus viscosity
- B) Increasing ciliary movement
- C) Stimulating the cough reflex
- D) Suppressing the cough reflex

5. Which of the following is an adverse effect of expectorants?

- A) Dry mouth
- B) Diarrhea
- C) Drowsiness

- D) Increased heart rate
- 6. Which expectorant is derived from the bark of a tree?**
- A) Ammonium chloride
  - B) Guaifenesin
  - C) Terpin hydrate
  - D) Eucalyptus oil
- 7. What is the primary use of expectorants in clinical practice?**
- A) Pain relief
  - B) Reducing fever
  - C) Cough relief
  - D) Nausea control
- 8. Which expectorant has a dual role as both an expectorant and a muscle relaxant?**
- A) Guaifenesin
  - B) Dextromethorphan
  - C) Codeine
  - D) Loratadine
- 9. How do expectorants affect the consistency of mucus?**
- A) They thicken it
  - B) They dissolve it
  - C) They make it more viscous
  - D) They thin it
- 10. Which of the following is NOT an expectorant?**
- A) Guaifenesin
  - B) Ammonium chloride
  - C) Codeine
  - D) Potassium iodide
- 11. Which of the following is a common emetic?**
- A) Loperamide
  - B) Ipecac syrup
  - C) Omeprazole
  - D) Ranitidine



**12. Emetics are used to induce vomiting for the purpose of?**

- A) Treating constipation
- B) Managing heartburn
- C) Emptying the stomach in case of poisoning
- D) Reducing fever

**13. Which of the following conditions is a contraindication for the use of emetics?**

- A) Poisoning by corrosive substances
- B) Overdose of non-corrosive substances
- C) Acute gastritis
- D) Both A and C

**14. Emetics should be administered within how many hours of ingestion of a poison for optimal effectiveness?**

- A) 1 hour
- B) 2 hours
- C) 3 hours
- D) 4 hours

**15. Which neurotransmitter is primarily involved in the vomiting reflex induced by emetics?**

- A) Dopamine
- B) Serotonin
- C) Acetylcholine
- D) Histamine

**16. What is the main action of ipecac syrup as an emetic?**

- A) Stimulates the stomach lining
- B) Decreases gastric motility
- C) Acts as a strong base
- D) Relieves heartburn

**17. Which of the following is an emetic used in veterinary medicine?**

- A) Xylazine
- B) Acepromazine
- C) Apomorphine
- D) Diazepam

**18. Emetics are contraindicated in which of the following scenarios?**

- A) Ingestion of hydrocarbons
- B) Alcohol overdose
- C) Overdose of aspirin
- D) Overdose of iron supplements

**19. Which part of the brain is primarily responsible for the vomiting reflex?**

- A) Cerebrum
- B) Hypothalamus
- C) Medulla oblongata
- D) Cerebellum

**20. What is the primary benefit of using emetics in acute poisoning cases?**

- A) Slows down toxin absorption
- B) Increases toxin absorption
- C) Promotes toxin elimination through vomiting
- D) Neutralizes the toxin

**21. Which of the following is a common haematinic?**

- A) Ferrous sulfate
- B) Paracetamol
- C) Warfarin
- D) Metformin

**22. Haematinics are used primarily for treating?**

- A) Hypertension
- B) Anemia
- C) Diabetes
- D) Hyperlipidemia

**23. Which vitamin is often combined with iron supplements to enhance absorption?**

- A) Vitamin A
- B) Vitamin B12
- C) Vitamin C
- D) Vitamin D

**24. A common side effect of oral iron supplements is?**

- A) Constipation
- B) Diarrhea
- C) Drowsiness
- D) Hypertension

**25. Which of the following is NOT a source of haematinics?**

- A) Red meat
- B) Leafy green vegetables
- C) Dairy products
- D) Legumes

**26. What is the primary role of haematinics in the body?**

- A) Regulate blood pressure
- B) Enhance blood oxygen-carrying capacity
- C) Control blood sugar levels
- D) Reduce cholesterol levels

**27. Which of the following minerals is essential for the production of hemoglobin?**

- A) Calcium
- B) Iron
- C) Potassium
- D) Magnesium

**28. Folic acid is important for which process in the body?**

- A) Bone formation
- B) Muscle contraction
- C) DNA synthesis
- D) Neural transmission

**29. Which condition is commonly treated with haematinics?**

- A) Hypertension
- B) Anemia
- C) Hyperglycemia
- D) Hypotension

**30. Which of the following is a common cause of iron-deficiency anemia?**

- A) Excessive alcohol consumption

- B) Chronic kidney disease
- C) Blood loss
- D) High cholesterol

**31. Which of the following is an antidote for acetaminophen (paracetamol) poisoning?**

- A) Atropine
- B) N-acetylcysteine
- C) Naloxone
- D) Activated charcoal

**32. Which substance is commonly used to induce vomiting in cases of poisoning?**

- A) Charcoal
- B) Emetics
- C) Saline
- D) Benzodiazepines

**33. Activated charcoal is most effective when given within how many hours after ingestion of a poison?**

- A) 1 hour
- B) 2 hours
- C) 4 hours
- D) 6 hours

**34. The antidote for opioid overdose is?**

- A) Flumazenil
- B) Atropine
- C) Naloxone
- D) Ethanol

**35. Which of the following is used as an antidote for cyanide poisoning?**

- A) Sodium thiosulfate
- B) Atropine
- C) Warfarin
- D) Vitamin K

**36. Which of the following substances is used to treat methanol poisoning?**

- A) Ethylene glycol



- B) Fomepizole
- C) Acetylcysteine
- D) Aspirin

**37. What is the antidote for digoxin toxicity?**

- A) Protamine sulfate
- B) Vitamin K
- C) Digoxin-specific antibody fragments
- D) Sodium bicarbonate

**38. Which antidote is used for organophosphate poisoning?**

- A) Atropine
- B) Protamine
- C) Fomepizole
- D) N-acetylcysteine

**39. What is the primary action of naloxone in opioid overdose?**

- A) Increases opioid absorption
- B) Blocks opioid receptors
- C) Enhances opioid metabolism
- D) Induces vomiting

**40. Which of the following is NOT a common symptom of poisoning?**

- A) Nausea
- B) Confusion
- C) Hyperactivity
- D) Abdominal pain

**41. Astringents are substances that cause?**

- A) Vasodilation
- B) Tissue contraction
- C) Increased secretion
- D) Muscle relaxation

**42. Which of the following is a common astringent used in skincare?**

- A) Salicylic acid
- B) Witch hazel

- C) Retinol
- D) Benzoyl peroxide

**43. Astringents are often used for which of the following purposes?**

- A) Increasing appetite
- B) Reducing inflammation
- C) Soothing sunburn
- D) Tightening pores

**44. Which of the following is an adverse effect of overuse of astringents?**

- A) Oily skin
- B) Dryness and irritation
- C) Hyperpigmentation
- D) Increased sweating

**45. Which natural substance is commonly known for its astringent properties?**

- A) Aloe vera
- B) Tea tree oil
- C) Cucumber extract
- D) Lemon juice

**46. Which of the following astringents is used in the treatment of hemorrhoids?**

- A) Witch hazel
- B) Glycerin
- C) Salicylic acid
- D) Tea tree oil

**47. Astringents can help in reducing which of the following skin conditions?**

- A) Eczema
- B) Acne
- C) Psoriasis
- D) Rosacea

**48. Which metal salt is commonly used as an astringent in medical practice?**

- A) Magnesium sulfate
- B) Zinc sulfate
- C) Potassium chloride

- D) Calcium carbonate

**49. Which of the following is NOT an effect of astringents?**

- A) Constriction of tissues
- B) Reduction of oiliness
- C) Increase in pore size
- D) Reduction of bleeding

**50. Astringents are often included in which type of personal care product?**

- A) Shampoos
- B) Deodorants
- C) Cleansers
- D) Toothpaste

**51. Which antidote is used for methanol or ethylene glycol poisoning?**

- A) Fomepizole
- B) Flumazenil
- C) Atropine
- D) Digoxin-specific antibodies

**52. What is the antidote for benzodiazepine overdose?**

- A) Naloxone
- B) Flumazenil
- C) Atropine
- D) Acetylcysteine

**53. Which of the following is a common sign of cyanide poisoning?**

- A) Respiratory depression
- B) Excessive salivation
- C) Garlic odor on breath
- D) Blurred vision

**54. The antidote for heparin overdose is?**

- A) Vitamin K
- B) Protamine sulfate
- C) Fresh frozen plasma
- D) Ethanol

**55. Which substance is used to treat arsenic poisoning?**

- A) Dimercaprol
- B) N-acetylcysteine
- C) Sodium bicarbonate
- D) Activated charcoal

**56. What is the primary action of sodium thiosulfate in cyanide poisoning?**

- A) Blocks cyanide absorption
- B) Converts cyanide to a less toxic form
- C) Enhances cyanide metabolism
- D) Induces vomiting

**57. Which of the following symptoms is associated with organophosphate poisoning?**

- A) Dry mouth
- B) Muscle weakness
- C) Increased heart rate
- D) Hyperactivity

**58. The antidote for digitalis toxicity is?**

- A) Digoxin-specific antibodies
- B) Sodium bicarbonate
- C) Calcium gluconate
- D) Magnesium sulfate

**59. What is the role of acetylcysteine in acetaminophen poisoning?**

- A) Enhances acetaminophen metabolism
- B) Neutralizes acetaminophen
- C) Replenishes glutathione levels
- D) Induces vomiting

**60. Which of the following is NOT a treatment option for poisoning?**

- A) Gastric lavage
- B) Hemodialysis
- C) Forced diuresis
- D) Hypothermia





## Answers

1. The common expectorant that helps in thinning mucus is Guaifenesin.
2. Expectorants primarily act on the lungs.
3. Guaifenesin is commonly used for wet cough.
4. Expectorants do not suppress the cough reflex; they reduce mucus viscosity, increase ciliary movement, and stimulate the cough reflex.
5. An adverse effect of expectorants is diarrhea.
6. Terpin hydrate is an expectorant derived from the bark of a tree.
7. The primary use of expectorants in clinical practice is cough relief.
8. Guaifenesin has a dual role as both an expectorant and a muscle relaxant.
9. Expectorants thin the consistency of mucus.
10. Codeine is not an expectorant.
11. Ipecac syrup is a common emetic.
12. Emetics are used to induce vomiting for the purpose of emptying the stomach in case of poisoning.
13. Emetics are contraindicated in cases of poisoning by corrosive substances and acute gastritis.
14. Emetics should be administered within 1 hour of ingestion of a poison for optimal effectiveness.
15. Serotonin is the neurotransmitter primarily involved in the vomiting reflex induced by emetics.
16. The main action of ipecac syrup as an emetic is to stimulate the stomach lining.
17. Apomorphine is an emetic used in veterinary medicine.
18. Emetics are contraindicated in cases of ingestion of hydrocarbons.
19. The medulla oblongata is the part of the brain primarily responsible for the vomiting reflex.
20. The primary benefit of using emetics in acute poisoning cases is promoting toxin elimination through vomiting.
21. Ferrous sulfate is a common haematinic.
22. Haematinics are used primarily for treating anemia.
23. Vitamin C is often combined with iron supplements to enhance absorption.
24. A common side effect of oral iron supplements is constipation.
25. Dairy products are not a source of haematinics.
26. The primary role of haematinics in the body is to enhance blood oxygen-carrying capacity.
27. Iron is the mineral essential for the production of hemoglobin.

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28. Folic acid is important for DNA synthesis.
29. Anemia is commonly treated with haematinics.
30. Blood loss is a common cause of iron-deficiency anemia.
31. The antidote for acetaminophen (paracetamol) poisoning is N-acetylcysteine.
32. Emetics are commonly used to induce vomiting in cases of poisoning.
33. Activated charcoal is most effective when given within 1 hour after ingestion of a poison.
34. The antidote for opioid overdose is Naloxone.
35. Sodium thiosulfate is used as an antidote for cyanide poisoning.
36. Fomepizole is used to treat methanol poisoning.
37. The antidote for digoxin toxicity is digoxin-specific antibody fragments.
38. The antidote used for organophosphate poisoning is Atropine.
39. The primary action of naloxone in opioid overdose is blocking opioid receptors.
40. Hyperactivity is not a common symptom of poisoning.
41. Astringents are substances that cause tissue contraction.
42. Witch hazel is a common astringent used in skincare.
43. Astringents are often used for tightening pores.
44. An adverse effect of overuse of astringents is dryness and irritation.
45. Lemon juice is a natural substance commonly known for its astringent properties.
46. Witch hazel is used in the treatment of hemorrhoids.
47. Astringents can help in reducing acne.
48. Zinc sulfate is a metal salt commonly used as an astringent in medical practice.
49. Astringents do not increase pore size; they constrict tissues, reduce oiliness, and reduce bleeding.
50. Astringents are often included in cleansers.
51. The antidote for methanol or ethylene glycol poisoning is Fomepizole.
52. The antidote for benzodiazepine overdose is Flumazenil.
53. A common sign of cyanide poisoning is a garlic odor on the breath.
54. The antidote for heparin overdose is Protamine sulfate.
55. Dimercaprol is used to treat arsenic poisoning.
56. The primary action of sodium thiosulfate in cyanide poisoning is converting cyanide to a less toxic form.
57. Muscle weakness is a symptom associated with organophosphate poisoning.

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58. The antidote for digitalis toxicity is digoxin-specific antibodies.
59. The role of acetylcysteine in acetaminophen poisoning is to replenish glutathione levels.
60. Hypothermia is not a treatment option for poisoning.

### Pharmaceutical inorganic chemistry Unit V

#### [Radiopharmaceuticals » PHARMACAREERS](#)

1. **What are radiopharmaceuticals primarily used for?**
  - A. Pain relief
  - B. Diagnostic imaging
  - C. Blood pressure regulation
  - D. Hormone replacement
2. **Which element is commonly used in the radiopharmaceutical technetium-99m?**
  - A. Iodine
  - B. Carbon
  - C. Technetium
  - D. Xenon
3. **Which of the following radiopharmaceuticals is used for thyroid imaging?**
  - A. Iodine-131
  - B. Fluorine-18
  - C. Gallium-67
  - D. Indium-111
4. **What type of radiation is emitted by technetium-99m?**
  - A. Alpha particles
  - B. Beta particles
  - C. Gamma rays
  - D. Neutrons
5. **Which radiopharmaceutical is used in PET scans?**
  - A. Iodine-123

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- B. Fluorine-18
  - C. Thallium-201
  - D. Carbon-11
6. **What is the half-life of technetium-99m?**
- A. 2 hours
  - B. 6 hours
  - C. 12 hours
  - D. 24 hours
7. **In which form are radiopharmaceuticals typically administered to patients?**
- A. Oral tablets
  - B. Injections
  - C. Topical creams
  - D. Inhalation
8. **Which of the following radiopharmaceuticals is used for bone imaging?**
- A. Strontium-89
  - B. Iodine-131
  - C. Fluorine-18
  - D. Technetium-99m
9. **What is the primary purpose of radiopharmaceuticals in therapeutic applications?**
- A. To treat infections
  - B. To kill cancer cells
  - C. To regulate heart rate
  - D. To reduce inflammation
10. **Which radiopharmaceutical is commonly used for myocardial perfusion imaging?**
- A. Thallium-201
  - B. Gallium-67
  - C. Indium-111
  - D. Iodine-123
11. **What is the primary advantage of using radiopharmaceuticals in diagnostic imaging?**
- A. Non-invasiveness
  - B. Cost-effectiveness



- C. Rapid results
  - D. High sensitivity and specificity
12. **Which of the following isotopes is used in the treatment of hyperthyroidism?**
- A. Carbon-14
  - B. Iodine-131
  - C. Technetium-99m
  - D. Gallium-67
13. **What is the role of a radiopharmacist?**
- A. To diagnose diseases
  - B. To prepare and dispense radiopharmaceuticals
  - C. To administer radiotherapy
  - D. To perform imaging scans
14. **Which of the following radiopharmaceuticals is used for brain imaging?**
- A. Iodine-123
  - B. Fluorine-18
  - C. Thallium-201
  - D. Indium-111
15. **What is a common side effect of radiopharmaceuticals used in therapy?**
- A. Nausea
  - B. Hair loss
  - C. Dry mouth
  - D. Fatigue
16. **Which radiopharmaceutical is used for liver and spleen imaging?**
- A. Technetium-99m sulfur colloid
  - B. Iodine-123
  - C. Gallium-67
  - D. Thallium-201
17. **What is the purpose of a gamma camera in nuclear medicine?**
- A. To produce magnetic fields
  - B. To detect gamma radiation from radiopharmaceuticals
  - C. To measure blood pressure



- D. To deliver chemotherapy
18. **Which radiopharmaceutical is used for sentinel lymph node imaging?**
- A. Technetium-99m sulfur colloid
  - B. Iodine-131
  - C. Indium-111
  - D. Gallium-67
19. **What is the main difference between diagnostic and therapeutic radiopharmaceuticals?**
- A. Diagnostic radiopharmaceuticals emit alpha particles, while therapeutic ones emit gamma rays.
  - B. Diagnostic radiopharmaceuticals are used for imaging, while therapeutic ones are used for treatment.
  - C. Diagnostic radiopharmaceuticals are taken orally, while therapeutic ones are injected.
  - D. Diagnostic radiopharmaceuticals are more expensive than therapeutic ones.
20. **Which radiopharmaceutical is used for renal imaging?**
- A. Technetium-99m MAG3
  - B. Iodine-123
  - C. Gallium-67
  - D. Thallium-201
21. **What type of radiation does Iodine-131 emit?**
- A. Alpha particles
  - B. Beta particles and gamma rays
  - C. Neutrons
  - D. X-rays
22. **What is the primary function of a PET scan in nuclear medicine?**
- A. To produce high-resolution anatomical images
  - B. To detect metabolic activity in tissues
  - C. To measure blood flow in arteries
  - D. To monitor bone density
23. **Which radiopharmaceutical is used for pulmonary perfusion imaging?**
- A. Technetium-99m MAA (macroaggregated albumin)
  - B. Iodine-123
  - C. Fluorine-18



- D. Thallium-201
24. **What is the purpose of using a radiotracer in nuclear medicine?**
- A. To enhance MRI images
  - B. To track biological processes
  - C. To improve ultrasound accuracy
  - D. To measure blood glucose levels
25. **Which radiopharmaceutical is used for infection imaging?**
- A. Gallium-67
  - B. Iodine-123
  - C. Technetium-99m
  - D. Indium-111
26. **What is the main purpose of using fluorine-18 in PET scans?**
- A. To detect bone fractures
  - B. To measure brain activity
  - C. To image the thyroid gland
  - D. To visualize metabolic processes
27. **Which radiopharmaceutical is used for prostate cancer imaging?**
- A. Technetium-99m
  - B. Iodine-131
  - C. Gallium-68 PSMA
  - D. Indium-111
28. **What is the role of a cyclotron in the production of radiopharmaceuticals?**
- A. To produce gamma rays
  - B. To accelerate charged particles to create radioactive isotopes
  - C. To generate high-frequency sound waves
  - D. To measure heart rate
29. **Which radiopharmaceutical is used for skeletal imaging?**
- A. Technetium-99m MDP (methylene diphosphonate)
  - B. Iodine-123
  - C. Gallium-67
  - D. Thallium-201



30. What is the primary function of a SPECT scan in nuclear medicine?

- A. To produce 3D images of organs
- B. To measure blood oxygen levels
- C. To monitor heart rate
- D. To detect brain tumors

31. Which radiopharmaceutical is used for cardiac stress tests?

- A. Iodine-123
- B. Fluorine-18
- C. Thallium-201
- D. Technetium-99m

32. What is the purpose of using radiopharmaceuticals in sentinel node biopsy?

- A. To diagnose bone fractures
- B. To locate lymph nodes
- C. To measure lung function
- D. To monitor kidney function

33. Which radiopharmaceutical is used for PET/CT scans in oncology?

- A. Technetium-99m
- B. Gallium-68
- C. Iodine-123
- D. Indium-111

34. What is the purpose of using radiopharmaceuticals in radionuclide therapy?

- A. To enhance MRI images
- B. To deliver targeted radiation to tumors
- C. To measure blood glucose levels
- D. To track brain activity

35. Which radiopharmaceutical is used for liver function imaging?

- A. Technetium-99m sulfur colloid
- B. Iodine-131
- C. Gallium-67
- D. Thallium-201

36. What is the role of a radiochemist in the production of radiopharmaceuticals?





- A. To diagnose diseases
- B. To synthesize and purify radioactive compounds
- C. To administer radiotherapy
- D. To perform imaging scans

37. **Which radiopharmaceutical is used for adrenal gland imaging?**

- A. Iodine-131
- B. Technetium-99m
- C. Gallium-67
- D. Iodine-123

38. **What is the primary purpose of using radiopharmaceuticals in cancer treatment?**

- A. To measure bone density
- B. To deliver targeted radiation therapy
- C. To monitor blood pressure
- D. To enhance CT images

39. **Which radiopharmaceutical is used for tumor imaging in the brain?**

- A. Fluorine-18
- B. Iodine-123
- C. Gallium-67
- D. Thallium-201

40. **What is the primary function of a radiopharmaceutical in nuclear cardiology?**

- A. To detect liver function
- B. To measure kidney function
- C. To assess heart perfusion and function
- D. To monitor lung function

### Answers

1. Radiopharmaceuticals are primarily used for diagnostic imaging.
2. The element commonly used in the radiopharmaceutical technetium-99m is technetium.
3. The radiopharmaceutical used for thyroid imaging is iodine-131.

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4. Technetium-99m emits gamma rays.
5. The radiopharmaceutical used in PET scans is fluorine-18.
6. The half-life of technetium-99m is 6 hours.
7. Radiopharmaceuticals are typically administered to patients in the form of injections.
8. The radiopharmaceutical used for bone imaging is technetium-99m.
9. The primary purpose of radiopharmaceuticals in therapeutic applications is to kill cancer cells.
10. Thallium-201 is commonly used for myocardial perfusion imaging.
11. The primary advantage of using radiopharmaceuticals in diagnostic imaging is their high sensitivity and specificity.
12. The isotope used in the treatment of hyperthyroidism is iodine-131.
13. The role of a radiopharmacist is to prepare and dispense radiopharmaceuticals.
14. Fluorine-18 is used for brain imaging.
15. A common side effect of radiopharmaceuticals used in therapy is fatigue.
16. The radiopharmaceutical used for liver and spleen imaging is technetium-99m sulfur colloid.
17. The purpose of a gamma camera in nuclear medicine is to detect gamma radiation from radiopharmaceuticals.



18. Technetium-99m sulfur colloid is used for sentinel lymph node imaging.
19. The main difference between diagnostic and therapeutic radiopharmaceuticals is that diagnostic radiopharmaceuticals are used for imaging, while therapeutic ones are used for treatment.
20. The radiopharmaceutical used for renal imaging is technetium-99m MAG3.
21. Iodine-131 emits beta particles and gamma rays.
22. The primary function of a PET scan in nuclear medicine is to detect metabolic activity in tissues.
23. The radiopharmaceutical used for pulmonary perfusion imaging is technetium-99m MAA (macroaggregated albumin).
24. The purpose of using a radiotracer in nuclear medicine is to track biological processes.
25. The radiopharmaceutical used for infection imaging is gallium-67.
26. The main purpose of using fluorine-18 in PET scans is to visualize metabolic processes.
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