TRR Govt. Degree College(A), Kandukuru
Chemistry Major/Minor
UNIT-II Ionic Bond
CHEMISTRY MCQs

1. Ionic compounds typically have:
   A. Low melting points
   B. High boiling points
   C. High melting points
   D. Low electrical conductivity in the solid state
2. The formation of ionic compounds is primarily favored by:
   A. Low ionization potential of the metal
   B. High electron affinity of the non-metal
   C. Large difference in electronegativity between the atoms
   D. All of the above
3. Ionization potential is defined as:
   A. The energy released when an atom gains an electron
   B. The energy required to remove the most loosely bound electron
   C. The energy required to add an electron to a neutral atom
   D. The energy released when an ionic bond is formed
4. Electron affinity can be best described as:
   A. The ability of an atom to attract electrons
   B. The energy change when an electron is added to a neutral atom
   C. The energy required to remove an electron from a negatively charged ion
   D. The energy required to ionize an atom
5. Electronegativity is important in determining:
   A. The ionic character of a bond
   B. The metallic character of a bond
   C. The covalent character of a bond
   D. The van der Waals forces between molecules
6. Lattice energy is influenced by:
   A. The charge on the ions and the distance between them
   B. The size of the ions
   C. The electron configuration of the ions
   D. Both A and B
7. The Born-Haber cycle is a graphical representation that relates:
   A. The lattice energy to the electron affinity
   B. The lattice energy to the ionization potential
   C. The enthalpy of formation of an ionic compound to various thermochemical steps
   D. The electronegativity of elements to their atomic number
8. A high lattice energy indicates:
   A. A stable ionic compound
   B. A compound with low melting point
   C. Poor solubility in water
   D. Low thermal stability
9. The stability of ionic compounds is NOT directly related to:
   A. Lattice energy
   B. Ionization potential
   C. Covalent character
   D. Electron affinity
10. Solubility of ionic compounds in water is generally higher for compounds with:
    A. High lattice energy
    B. Low lattice energy
    C. High ionization energy
    D. Low electron affinity
11. Thermal stability of ionic compounds increases with:
    A. Decrease in lattice energy
    B. Increase in lattice energy
    C. Increase in covalent character
    D. Decrease in ion sizes
12. Covalent character in ionic compounds is indicated by:
    A. High lattice energy
    B. Low electronegativity difference
    C. High polarization
    D. Low ionization potential
13. According to Fajan's rules, ionic bonds tend to have more covalent character when:
    A. The cation is large and the anion is small
    B. The cation is small and highly charged
    C. The anion is large and highly charged
    D. Both B and C
14. Factors affecting lattice energy do NOT include:
    A. Electronegativity difference
    B. Ion sizes
    C. Charge on the ions
    D. Electron affinity of the ions
15. The Born-Haber cycle helps in determining the:
    A. Magnetic properties of ionic compounds
    B. Solubility of ionic compounds in non-polar solvents
    C. Enthalpy of formation of ionic compounds
    D. Electrical conductivity in the solid state of ionic compounds
16. Which is NOT a property of ionic compounds?
    A. High melting and boiling points
    B. Diamagnetic behavior
    C. High electrical conductivity in molten state
    D. High electrical conductivity in solid state
17. Ionization potential trends in the periodic table show that it:
    A. Increases across a period and decreases down a group
    B. Decreases across a period and increases down a group
    C. Remains constant across a period
    D. Increases both across a period and down a group
18. Electron affinity is typically more negative for:
    A. Metals
    B. Non-metals
    C. Noble gases
    D. Alkali metals
19. The electronegativity difference that typically leads to ionic bonding is:
    A. Less than 0.4
    B. Between 0.4 and 1.7
    C. Greater than 1.7
    D. Exactly 2.0
20. In terms of lattice energy, the solubility of ionic compounds in water:
    A. Increases with increasing lattice energy B. Decreases with increasing lattice energy
    C. Is not related to lattice energy
    D. Increases with decreasing ionization potential
21. Fajan's rules state that ionic compounds exhibit more covalent character due to:
    A. Larger anions
    B. Smaller cations with lower charge
    C. Larger cations with higher charge
    D. Smaller cations with higher charge
22. The thermal stability of ionic compounds is least likely to be affected by:
    A. The size of the anion
    B. The charge on the cation
    C. The electronegativity of the cation
    D. The polarization of the anion
23. Covalent character in ionic compounds leads to:
    A. Decrease in melting and boiling points
    B. Increase in melting and boiling points
    C. No change in electrical conductivity
    D. Increase in solubility in polar solvents
24. The Born-Haber cycle can be used to calculate all of the following EXCEPT:
    A. Lattice energy
    B. Ionization potential

C. Enthalpy of vaporization
D. Enthalpy of formation

25. Polarization affects the solubility of ionic compounds by:
A. Increasing solubility in non-polar solvents
B. Decreasing solubility in polar solvents C. Increasing solubility in polar solvents D. Having no effect on solubility
26. Lattice energy of an ionic compound is primarily a measure of:
A. Its solubility in water
B. The strength of the ionic bonds
C. Its electrical conductivity
D. The covalent character of the bonding
27. The electronegativity difference that favors the formation of ionic compounds is typically:
A. Less than 0.5
B. Between 0.5 and 1.0
C. Between 1.0 and 2.0
D. Greater than 2.0
28. Which factor does NOT directly influence ionization potential?
A. Atomic size
B. Nuclear charge
C. Electron shielding
D. Lattice energy
29. An increase in electron affinity indicates:
A. A stronger tendency to lose electrons
B. A stronger tendency to gain electrons
C. A decrease in ionic character
D. An increase in metallic character
30. The Born-Haber cycle involves all of the following steps EXCEPT:
A. Sublimation
B. Electron affinity
C. Ionization energy
D. Electronegativity calculation
31. Which of the following trends is true for lattice energy?
A. It decreases as ion size increases
B. It increases as ion size increases
C. It remains constant regardless of ion size
D. It decreases as the charge on the ions decreases
32. Stability of ionic compounds can be increased by:
A. Decreasing the size of the cation
B. Increasing the size of the anion
C. Decreasing the charge on both ions
D. Increasing the electronegativity difference
33. Solubility of ionic compounds is generally decreased by:
A. Higher lattice energy
B. Lower lattice energy
C. Smaller ions
D. Larger electronegativity difference
34. Thermal stability of ionic compounds is directly related to:
A. Their covalent character
B. The size of the anions
C. Lattice energy
D. The charge on the cations
35. Fajan's rules suggest that a smaller cation will:
A. Increase the ionic character of the compound
B. Decrease the ionic character of the compound
C. Have no effect on the ionic character of the compound
D. Increase the metallic character of the compound
36. Ionic compounds with high covalent character tend to have:
A. Higher melting points
B. Lower melting points
C. Higher electrical conductivity
D. Lower electrical conductivity
37. The enthalpy of formation of an ionic compound is influenced by:
A. The size of the cation only
B. The charge on the ions
C. The electronegativity of the anion
D. Both B and C
38. Which is NOT a characteristic effect of polarization in ionic compounds?
A. Increased solubility in non-polar solvents
B. Decreased melting points
C. Increased thermal stability
D. Increased electrical conductivity
39. The Born-Haber cycle can NOT be used to estimate:
A. The ionization energy of the metal
B. The electron affinity of the non-metal C. The specific heat capacity of the compound
D. The lattice energy of the compound
40. High electron affinity values are typically found in:
A. Metals
B. Non-metals
C. Noble gases
D. Alkali metals
41. In terms of electronegativity, ionic bonds are formed between elements with:
A. Similar electronegativities
B. Moderately different electronegativities C. Highly different electronegativities
D. Identical electronegativities
42. The solubility of ionic compounds in polar solvents is primarily due to:
A. Low lattice energy
B. High lattice energy
C. High covalent character
D. Low ionization energy
43. Thermal stability in ionic compounds is less likely to be found in those with:
A. High lattice energy
B. Low lattice energy
C. Small ions
D. Large electronegativity differences
44. Polarization in ionic compounds is least likely to increase:
A. Solubility in non-polar solvents
B. Covalent character
C. Melting points
D. Thermal stability
45. Lattice energy is NOT directly measurable but can be estimated from:
A. Direct experimental observations
B. The Born-Haber cycle
C. The electronegativity values of the constituent ions
D. The ionization potential and electron affinity values
46. A high degree of covalent character in an ionic compound is indicated by:
A. High solubility in water
B. Low solubility in non-polar solvents
C. Lower melting and boiling points
D. High electrical conductivity in the solid state
47. Electronegativity differences affect ionic compound formation because they:
A. Decrease the potential for ion formation
B. Increase the potential for electron sharing
C. Increase the potential for complete electron transfer
D. Are irrelevant to the type of bonding
48. The enthalpy of formation (ΔH_f) of ionic compounds is typically:
A. Positive, indicating endothermic formation
B. Negative, indicating exothermic formation
C. Zero, indicating no energy change
D. Variable, depending on the compound
49. Solubility trends in ionic compounds show that solubility generally:
A. Increases with increasing lattice energy B. Decreases with increasing lattice energy
C. Is independent of lattice energy
D. Is proportional to the charge on the ions
50. Fajan's rules imply that ionic compounds with smaller anions and larger cations:
A. Have higher melting points
B. Are more soluble in polar solvents
C. Exhibit increased covalent character
D. Are more thermally stable

Key:

1. C
2. D
3. B
4. B
5. A
6. D
7. C
8. A
9. D
10. B
11. B
12. C
13. D
14. D
15. C
16. D
17. A
18. B
19. C
20. B
21. D
22. C
23. A
24. C
25. A
26. B
27. D
28. D
29. B
30. D
31. A
32. D
33. A
34. C
35. B
36. B
37. D
38. D
39. C
40. B
41. C
42. A
43. B
44. A
45. B
46. C
47. C
48. B
49. B
50. C