

COVENANT UNIVERSITY
NIGERIA

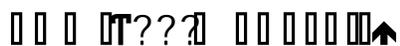
TUTORIAL KIT
OMEGA SEMESTER

PROGRAMME: CHEMISTRY

COURSE: CHM 122

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1. What is the name given to the electrons in the highest occupied energy level of an atom?

- a. orbital electrons
- b. valence electrons
- c. anions
- d. cations

2. How does calcium obey the octet rule when reacting to form compounds?

- a. It gains electrons.
- b. It gives up electrons.
- c. It does not change its number of electrons.
- d. Calcium does not obey the octet rule.

3. What is the charge on the strontium ion?

- a. 2-
- b. 1-
- c. 1+
- d. 2+

4. How many electrons does barium have to give up to achieve a noble-gas electron configuration?

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

5. What is the formula of the ion formed when potassium achieves noble-gas electron configuration?

a. K^{2+}

c. K^{-1}

b. K^{+}

d. K^{2-}

6. Which of the following ions has a pseudo-noble-gas electron configuration?

a. Fe^{2+}

c. Cu^{+}

b. Mn^{2+}

d. Ni^{+}

7. Which of the following elements does NOT form an ion with a charge of 1^{+} ?

a. fluorine

c. potassium

b. hydrogen

d. sodium

8. What is the charge on the cation in the ionic compound sodium sulfide?

a. 0

c. 2^{+}

b. 1^{+}

d. 3^{+}

9. Which of the following occurs in an ionic bond?

a. Oppositely charged ions attract.

b. Two atoms share two electrons.

c. Two atoms share more than two electrons.

d. Like-charged ions attract.

10. What is the net charge of the ionic compound calcium fluoride?

a. 2^{-}

c. 0

b. 1^{-}

d. 1^{+}

11. How many valence electrons are transferred from the nitrogen atom to potassium in the formation of the compound potassium nitride?

- a. 0
- b. 1
- c. 2
- d. 3

12. How many valence electrons are transferred from the calcium atom to iodine in the formation of the compound calcium iodide?

- a. 0
- b. 1
- c. 2
- d. 3

13. What is the formula unit of sodium nitride?

- a. NaN
- b. Na₂N
- c. Na₃N
- d. NaN₃

14. What is the formula unit of aluminum oxide?

- a. AlO
- b. Al₃O
- c. AlO₃
- d. Al₂O₃

15. What is the name of the ionic compound formed from lithium and bromine?

- a. lithium bromine
- b. lithium bromide
- c. lithium bromium
- d. lithium bromate

16. What is the formula for sodium sulfate?

- a. carbon
- b. oxygen
- c. fluorine
- d. nitrogen

23. Which of the following is the name given to the pairs of valence electrons that do not participate in bonding in diatomic oxygen molecules?

- a. unvalenced pair
- b. outer pair
- c. inner pair
- d. unshared pair

24. Which of the following diatomic molecules is joined by a double covalent bond?

- a. O₂
- b. Cl₂
- c. N₂
- d. He₂

25. A molecule with a single covalent bond is _____.

- a. CO₂
- b. Cl₂
- c. CO
- d. N₂

26. Once formed, how are coordinate covalent bonds different from other covalent bonds?

- a. They are stronger.
- b. They are more ionic in character.
- c. They are weaker.
- d. There is no difference.

27. When H⁺ forms a bond with H₂O to form the hydronium ion H₃O⁺, this bond is called a coordinate covalent bond because _____.

- a. both bonding electrons come from the oxygen atom
- b. it forms an especially strong bond

- c. the electrons are equally shared
- d. the oxygen no longer has eight valence electrons

28. Which of the following atoms acquires the most negative charge in a covalent bond with hydrogen?

- a. C
- b. Na
- c. O
- d. S

29. Which of the following covalent bonds is the most polar?

- a. H—F
- b. H—C
- c. H—H
- d. H—N

30. What causes hydrogen bonding?

- a. attraction between ions
- b. motion of electrons
- c. sharing of electron pairs
- d. bonding of a covalently bonded hydrogen atom with an unshared electron pair

31. Why is hydrogen bonding only possible with hydrogen?

- a. Hydrogen's nucleus is electron deficient when it bonds with an electronegative atom.
- b. Hydrogen is the only atom that is the same size as an oxygen atom.
- c. Hydrogen is the most electronegative element.
- d. Hydrogen tends to form covalent bonds.

32. Which of the following will not react with hydrochloric acid to give hydrogen peroxide,



- a. KO_2
- b. Na_2O_2
- c. Na_2O
- d. RbO_2

33. What are the main products formed when rubidium nitride, Rb_3N decomposes at low temperature and reacts with water vapour?

- a. $\text{RbOH}(\text{aq})$ and $\text{N}_2(\text{g})$
- b. $\text{RbOH}(\text{aq})$ and $\text{NH}_3(\text{g})$
- c. $\text{RbO}_2(\text{s})$ and $\text{NH}_3(\text{aq})$
- d. $\text{RbO}_2(\text{s})$ and $\text{NH}_3(\text{g})$

34. The reaction in which caesium dissolves in ammonia is written as follows:



- a. an ionic amide
- b. a covalent amine
- c. a neutral amine
- d. a neutral amide

35. Which of the following reactions is not feasible?

- a. $2\text{KNO}_3(\text{s}) \xrightarrow{\Delta} 2\text{KNO}_2(\text{s}) + \text{O}_2(\text{g})$
- b. $2\text{NaNO}_3(\text{s}) \xrightarrow{\Delta} 2\text{NaNO}_2(\text{s}) + \text{O}_2(\text{g})$
- c. $4\text{LiNO}_3(\text{s}) \xrightarrow{\Delta} 2\text{Li}_2\text{O}(\text{s}) + 4\text{NO}_2(\text{g}) + \text{O}_2(\text{g})$
- d. $4\text{RbNO}_3(\text{s}) \xrightarrow{\Delta} 2\text{Rb}_2\text{O}(\text{s}) + 4\text{NO}_2(\text{g}) + \text{O}_2(\text{g})$

36. Which of these compounds is more thermally stable?

- a. Rb_2SO_4
- b. RbNO_3
- c. Rb_2CO_3
- d. RbHCO_3

37. The following alkali metal halides will not dissolve in ethoxy ethane except

- a. CsI
- b. NaI
- c. NaI
- d. LiCl

38. All of the following are the uses of soda ash, Na_2CO_3 EXCEPT.

- a. It is a fine white powder used for the manufacture of glass
- b. It is widely used in the paper industry and in the manufacture of soap and detergents
- c. It is used as a water softener and in the laboratory
- d. It is used for making gunpowder

39. Potassium superoxide has the ability to absorbwhile giving off at the same time

- a. H_2O vapour; NO_2
- b. H_2O vapour; NO
- c. CO_2 ; O_2
- d. CO ; H_2

40. The atomic radius of Sr is 2.15 \AA , while its ionic radius is 1.13 \AA , what is the major reason for this difference?

- a. due to loss of outermost valence shell

- b. due to delocalization of inner shell electrons
- c. due to gain of kinetic energy by electron
- d. due to gain of addition electron shell

SOLUTION

- 1. ANS: B
- 2. ANS: B
- 3. ANS: D
- 4. ANS: B
- 5. ANS: B
- 6. ANS: C
- 7. ANS: A
- 8. ANS: B
- 9. ANS: A
- 10. ANS: C
- 11. ANS: A
- 12. ANS: C
- 13. ANS: C
- 14. ANS: D
- 15. ANS: B
- 16. ANS: B
- 17. ANS: B
- 18. ANS: A
- 19. ANS: A
- 20. ANS: C
- 21. ANS: B

22. ANS: D

23. ANS: D

24. ANS: A

25. ANS: B

26. ANS: D

27. ANS: A

28. ANS: C

29. ANS: A

30. ANS: D

31. ANS: A