Ionic bond

1. State whether the following are ionic or covalent :

(i) Na_2S (ii) $SnCl_4$ (iii) diamond (iv) CaC_2 (v)NaH
(vi) C_2H_4 (vii) $CaCl_2$ (viii) HCl gas (ix) NH_4^+ (x) KBr

2. Indicate whether the following pairs of elements form ionic or covalent compounds and write down the molecular formula of the compound formed.

(i) Sodium and chlorine (ii) carbon and sulphur (iii) sulphur and oxygen (iv) calcium and hydrogen

3. What type of bonds are present in the following molecules ?

(i) MgF_2 (ii) BrCl (iii) CBr_4 (iv) H_2SO_4 (v) SO_2
(vi) HNO_3

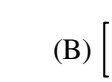
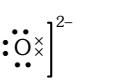
4. Most predominantly ionic compounds are obtained by the combination of elements of the groups :

(A) 1 and 7 (B) 2 and 6 (C) 4 and 8 (D) 3 and 5

5. Which set have strongest tendency to form anions :

(A) Ga, In, Te (B) Na, Mg, Al (C) N, O, F (D) V, Cr, Mn

6. Which lewis dot structure for O^{2-} ion is correct–

(A)  (B) (C)  (D) 

7. Which of the following bonds is most polar ?

(A) O – H (B) P – H (C) C – F (D) S – Cl

8. Two elements X and Y have following electronic configuration. X : $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 4s^2$ Y : $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^5$,The expected compound formed by combination of X and Y will be expressed as-

(A) XY_2 (B) X_5Y_2 (C) X_2Y_5 (D) XY_5

9. The electronegativity of O,F,N, Cl and H are 3.5, 4.0, 3.0, 3.2 and 2.1 respectively.The strongest bond will be

(A) F – H (B) H – Cl (C) N – H (D) O – H

10. Ionic bonds are usually formed by combination of elements with

(A) high ionisation potential and low electron affinity (B) low ionisation potential and high electron affinity

(C) high ionisation potential and high electron affinity(D) low ionisation potential and low electron affinity

Lattice energy

11. For lattice energy the following statements are false :

(A) it increases with increase in charge on cation.

(B) it increases with increase in charge on anion.

(C) it increases with decrease in inter ionic distance

(D) it increases with increase in size of cations and anions.

12. Which of the following sequences represents the correct order of lattice energies ?

(A) LiI > LiBr < LiCl < LiF (B) KBr < KCl < KF < KI

(C) NaF < NaCl < NaBr > NaI (D) LiF > LiCl > LiBr > LiI

13. The correct expected order of decreasing lattice energy is

(A) CaO > $MgBr_2$ > CsI (B) $MgBr_2$ > CaO > CsI

(C) CsI > $MgBr_2$ > CaO (D) CsI > CaO > $MgBr_2$

14. Which of the following is the right order of lattice energy

(A) $Na_2O < Al_2O_3 < MgO$ (B) $MgO < Al_2O_3 < Na_2O$

(C) $Al_2O_3 < MgO < Na_2O$ (D) $Na_2O < MgO < Al_2O_3$

15. If it is known that on heating a ionic compound of a polyhalide with a cation it decomposese into more stable halide of that cation due to high lattice energy, for example $CsI_3 \xrightarrow{\Delta} CsI + I_2$

The complex compound Rb[IBrCl] after strong heating will

(A) RbI + BrCl (B) RbCl + IBr (C) RbBr + ICl (D) None

Hydration energy

16. Find the correct ionic mobility order-

(A) F^- (aq) > Cl^- (aq) (B) Li^+ (aq) > Be^{2+} (aq) (C) Ca^{2+} (aq) > Ba^{2+}(aq) (D) Li^+ (aq) < Al^{3+} (aq)

17. Choose the INCORRECT order of hydrated size of the ions -

(A) $F^{\ominus}_{(aq.)} > Cl^{\ominus}_{(aq.)} > Br^{\ominus}_{(aq.)} > I^{\ominus}_{(aq.)}$ (B) $Rb^{\oplus}_{(aq.)} > K^{\oplus}_{(aq.)} > Na^{\oplus}_{(aq.)} > Li^{\oplus}_{(aq.)}$

(C) $Na^{\oplus}_{(aq.)} > Mg^{2+}_{(aq.)} > Al^{3+}_{(aq.)}$ (D) $Be^{2+}_{(aq.)} > Mg^{2+}_{(aq.)} > Ca^{2+}_{(aq.)} > Sr^{2+}_{(aq.)}$

18. Find the INCORRECT ionic mobility order from the following options-

(A) $Be^{2+}_{(aq.)} < Li^{+}_{(aq.)}$ (B) $Mg^{2+}_{(aq.)} < Sr^{2+}_{(aq.)}$ (C) $Fe^{2+}_{(aq.)} < Fe^{3+}_{(aq.)}$ (D) $Br^{-}_{(aq.)} < I^{-}_{(aq.)}$

Polarisation (Fajan's rule)

19. Polarisibility of halide ions increases in the order

(A) F^-, I^-, Br^-, Cl^- (B) Cl^-, Br^-, I^-, F^- (C) I^-, Br^-, Cl^-, F^- (D) F^-, Cl^-, Br^-, I^-

20. Which of the following is most covalent ?

(A) AlF_3 (B) $AlCl_3$ (C) $AlBr_3$ (D) AlI_3

21. Among LiCl, $BeCl_2$, BCl_3 and CCl_4, the covalent bond character follows the order -

(A) LiCl < $BeCl_2$ > BCl_3 > CCl_4 (B) LiCl > $BeCl_2$ < BCl_3 < CCl_4

(C) LiCl < $BeCl_2$ < BCl_3 < CCl_4 (D) LiCl > $BeCl_2$ > BCl_3 > CCl_4

22. Which has maximum covalent character ?

(A) NaCl (B) $SiCl_4$ (C) $AlCl_3$ (D) $MgCl_2$

23. Choose the correct statement

(A) A cation with pseudo noble gas configuration is more polarising than the cation with noble gas configuration.

(B) Small cation has minimum capacity to polarise an anion.

(C) Small anion has maximum polarizability.

(D) None of these

24. Magnesium cation has plarisation power close to that of :-

(A) Li^+ (B) Na^+ (C) K^+ (D) Cs^+

25. Which of the following combination of ion will have highest polarisation :-

(A) Fe^{2+}, Br^- (B) Ni^{4+}, Br^- (C) Ni^{2+}, Br^- (D) Fe, Br^-

26. An ion without pseudo-inert gas configuration is :

(A) Ag^+ (B) Cd^{2+} (C) Zn^{2+} (D) Fe^{3+}

Similar questions belongs to NCERT Text Book Problem - 4.1, 4.2, 4.3

Excercise - 4.4, 4.5, 4.6, 4.12, 4.19, 4.20

Answers

RACE # 11

1. (i) $Na_2S \rightarrow$ ionic, (ii) $SnCl_4 \rightarrow$ ionic, (iii) Diamond $\rightarrow$ covalent, (iv) $CaC_2 \rightarrow$ ionic
(v) $NaH \rightarrow$ ionic, (vi) $C_2H_4 \rightarrow$ covalent, (vii) $CaCl_2 \rightarrow$ ionic, (viii) $HCl(g) \rightarrow$ covalent
(ix) $NH_4^+ \rightarrow$ covalent, (x) $KBr \rightarrow$ ionic

2. (i) ionic $\rightarrow$ NaCl, (ii) Covalent $\rightarrow CS_2$, (iii) Covalent $\rightarrow SO_2$, (iv) ionic $\rightarrow CaH_2$

3. (i) ionic, (ii) covalent, (iii) covalent, (iv) covalent, (v) covalent, (vi) covalent

4. (A) **5.** (C) **6.** (B) **7.** (C) **8.** (A) **9.** (A) **10.** (B) **11.** (D) **12.** (D) **13.** (A)
14. (D) **15.** (B) **16.** (B) **17.** (B) **18.** (C) **19.** (D) **20.** (D) **21.** (C) **22.** (B) **23.** (A)
24. (A) **25.** (B) **26.** (D)