

Class: 11
Subject: Chemistry
Topic: P-block elements
No. of Questions: 20
Duration: 60 Min
Maximum Marks: 60

1. Boron carbide is used

- A. in nuclear reactor to absorb neutrons
- B. as an abrasive
- C. as both (a) and (b)
- D. as none of the above

Solution: C

2. Assertion (A) Borazine is called inorganic benzene.

Reason (R) Borazine undergoes addition and substitution reactions with HCl and Br₂ etc.

- A. Both (A) and (R) are true and (R) is the correct explanation of(A).
- B. Both (A) and (R) are true but (R) is not the correct explanation of(A).
- C. (A) is true but (R) is false.
- D. (A) is false but (R) is true.

Solution: A

3. Borax is used

- A. as a flux in brazing and in silver soldering
- B. in making enamel
- C. in leather tanning
- D. in all given above

Solution: D

4. Boron does not form B³⁺cation easily. It is due to

- A. energy required to form B³⁺ ion is for more than that which would be compensated by lattice energies or hydration energies of such ion
- B. boron is non metal
- C. boron is semiconductor
- D. None of the above

Solution: A

5. When orthoboric acid is heated to red heat the residue is

- A. boron
- B. boric oxide
- C. metaboric acid
- D. pyroboric acid

Solution: B



6. Boric acid is the trivial name for

- A. orthoboric acid
- B. metaboric acid
- C. pyroboric acid
- D. None of these

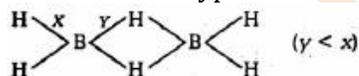
Solution: A

7. Which of the following is false statement?

- A. BH_3 is a Lewis acid
- B. All the B-H distances in diborane (B_2H_6) are equal
- C. Boranes are easily hydrolysed
- D. LiAlH_4 reduces BCl_3 to borane

Solution: B

There are two types of bonds in B_2H_6 and have different bond-lengths.



8. Assertion (A) AlCl_3 forms dimer Al_2Cl_6 but it dissolves in H_2O forming $[\text{Al}(\text{H}_2\text{O})_6]^{3+}$ and Cl^- ions. Reason (R) Aqueous solution of AlCl_3 is acidic due to hydrolysis.

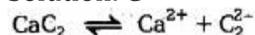
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- B. Both (A) and (R) are true but (R) is not the correct explanation of (A).
- C. (A) is true but (R) is false.
- D. (A) is false but (R) is true.

Solution: B

9. Which of the following is the ionic carbide?

- A. Fe_3C
- B. SiC
- C. CaC_2
- D. Cu_2C

Solution: C



Other carbides are not decomposed by H₂O and are covalent in nature.

10. Stability of hydrides of carbon family is in order

- A. CH₄ > SiH₄ > GeH₄ > SnH₄ > PbH₄
- B. CH₄ < SiH₄ < GeH₄ < SnH₄ < PbH₄
- C. CH₄ > SnH₄ > GeH₄ > SiH₄ > PbH₄
- D. None of the above

Solution: A

As we go down the group in Periodic Table, ionic nature increases, covalent nature decreases. Thus, stability decreases. Thus, CH₄ is maximum stable.

CH₄ > SiH₄ > GeH₄ > SnH₄ > PbH₄ Also due to inert pair effect stability of +4 state decreases down the group.

11. Assertion (A) PbCl₂ is more stable than PbCl₄. Reason (R) PbCl₄ is powerful oxidising agent.

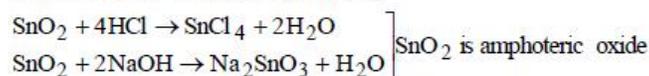
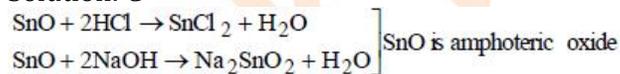
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- C. (A) is true but (R) is false.
- D. (A) is false but (R) is true.

Solution: B

12. Amphoteric oxides are

- A. SnO, SnO₂
- B. GeO, GeO₂
- C. Both (a) and (b)
- D. None of these

Solution: C



Similarly GeO, GeO₂ are amphoteric oxide.

13. Chemical formula of phosgene is

- A. COCl₂
- B. CaOCl₂
- C. CaCO₃
- D. COCl

Solution: A

Phosgene is another name of carbonyl chloride (COCl₂).

14. Carbon suboxide (C₃O₂) is formed when

- A. carbon reacts with conc. H₂SO₄
- B. malonic acid reacts with P₄O₁₀
- C. carbon reacts with strong alkali solution

D. oxalic acid is heated strongly

Solution: B

15. Sulphide mineral + $CN^- \xrightarrow{Zn} [M(MCN)_2]^- + 2[M(CN)_2]^- + Zn \rightarrow [Zn(CN)_4]^{2-} + 2M$ can be

A. Mg, Ag, Au

B. Ag, Au

C. Pt, Au

D. Pt, Ag

Solution: B

It is metallurgical extraction of silver and gold.

16. Which gas is used in aerated water?

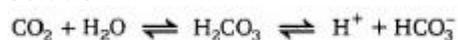
A. CO₂

B. SO₂

C. CO

D. Water vapours

Solution: A



17. Green house effect is due to

A. disturbance of the earth's delicate thermal balance

B. absorption of heat radiation by atmospheric gases particularly water vapours

C. Both (a) and (b)

D. None of the above

Solution: C

18. Assertion (A) PbCl₂ is more stable than PbCl₄. Reason (R) PbCl₄ is powerful oxidising agent.

A. Both (A) and (R) are true and (R) is the correct explanation of (A).

B. Both (A) and (R) are true but (R) is not the correct explanation of (A).

C. (A) is true but (R) is false.

D. (A) is false but (R) is true.

Solution: B

19. The variation in element-element bond energy follows the order

A. C-C > Si-Si > Ge-Ge > Sn-Sn > Pb-Pb

B. Si-Si > C-C > Pb-Pb > Sn-Sn > Ge-Ge

C. C - C > Ge - Ge > Sn - Sn > Pb - Pb > Si - Si

D. C-C > Sn-Sn > Pb-Pb > Ge-Ge > Si-Si

Solution: A

20. Select the correct statement.

A. Oxides of carbon family (MO₂) are all network solids with octahedral coordination.

B. Silicon dioxide (silica) is a network solid with tetrahedral coordination and is a giant molecule.

C. GeO₂, SnO₂ and PbO₂ are all acidic oxides.

D. None of the above appears correct.

Solution: B

Carbon can't form octahedral coordination due to maximum covalency 4. (non-availability of d orbital) Si can expand its octet and covalency is +6, thus octahedral coordination is possible.

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