Previous Year Questions

Subject	Chemistry
Class	11
Topic Name	P Block

1. Chlorine water on standing loses its colour and forms:-
(1) HCl and $HClO_2$
(2) HCl only
(3) HOCl and $HOCl_2$
(4) HCl and HOCl
Solution:
$Cl_2 + H_2O \rightarrow HCl + HOCl$
Hence option (4) is the answer.

2. Which one has the highest boiling point?
(1) Kr
(2) Xe
(3) He
(4) Ne
Solution:
The boiling point increases down the group.
Hence Xe has the highest boiling point in the given elements.
Hence option (2) is the answer.

3.The gas evolved on heating CaF_2 and SiO_2 with concentrated H_2SO_4, on hydrolysis gives a white gelatinous precipitate. The precipitate is:
(1) silica gel
(2) silicic acid
(3) hydrofluosilicic acid
(4) calcium fluorosilicate
Solution:
$H_2SO_4 + CaF_2 \rightarrow CaSO_4 + 2HF$
$4HF + SiO_2 \rightarrow SiF_4 + 2H_2O$
$3SiF_4 + 2H_2O \rightarrow 2H_2SiF_6 + SiO_2$
Hydrofluosilicic acid is H_2SiF_6
Hence option (3) is the answer.

4. Which one of the following depletes the ozone layer?
(1) NO and freons
(2) SO_2
(3) CO
(4) CO_2

Solution:
NO and freons deplete the ozone layer.
Hence option (1) is the answer.

5. The amorphous form of silica is
(1) cristobalite
(2) kieselguhr
(3) tridymite
(4) quartz.
Solution:
Kieselguhr is the amorphous form of silica.
Hence option (2) is the answer.

6. Assertion: Among the carbon allotropes, diamond is an insulator, whereas, graphite is a good conductor of electricity.
Reason: Hybridization of carbon in diamond and graphite are sp3 and sp2, respectively.
(1) Both assertion and reason are correct, but the reason is not the correct explanation for the assertion.
(2) Both assertion and reason are correct, and the reason is the correct explanation for the assertion.
(3) Both assertion and reason are incorrect.
(4) Assertion is an incorrect statement, but the reason is correct.
Solution:
Diamond is a bad conductor of electricity due to the non-availability of free electrons. Graphite is a good conductor of electricity due to the fourth valence electron of each carbon which is free to move.
Hence option (1) is the answer.

7. From the following statements regarding H_2O_2, choose the incorrect statement :
(1) It has to be stored in plastic or wax-lined glass bottles in the dark
(2) It has to be kept away from dust
(3) It can act only as an oxidizing agent
(4) It decomposes on exposure to light
Solution:
$Na_2SO_3 + H_2O_2 \rightarrow Na_2SO_4 + H_2O$
Hydrogen peroxide can act as both oxidising and reducing agent.
Hence option (3) is the answer.

8. Which of the following statements regarding sulphur is incorrect?
(1) At 6000 the gas mainly consists of S_2 molecules
(2) The oxidation state of sulphur is never less than +4 in its compounds
(3) S_2 molecule is paramagnetic
(4) The vapour at 2000 C consists mostly of S_8 rings
Solution:
The oxidation state of sulphur is +2, +4, +6 and -2.
Hence option (2) is the answer.

9. Example of a three-dimensional silicate is :
(1) Beryls
(2) Zeolites
(3) Feldspars

(4) Ultramarines
Solution:
Feldspars are an example of three-dimensional silicate.
Hence option (3) is the answer.

10.The compound that does not produce nitrogen gas by the thermal decomposition is
(1) $(NH_4)_2Cr_2O_7$
(2) NH_4NO_7
(3) $(NH_4)_2SO_4$
(4) $Ba(N_3)_2$
Solution:
$(NH_4)_2SO_4 \rightarrow 2NH_3 + H_2SO_4$
On thermal decomposition of $(NH_4)_2SO_4$, NH_3 is evolved. On thermal decomposition of the other given compounds, N_2 is evolved.
Hence option (3) is the answer.

11. What may be expected to happen when phosphine gas is mixed with chlorine gas?
(1) The mixture only cools down
(2) PCl_3 and HCl are formed and the mixture warms up
(3) PCl_5 and HCl are formed and the mixture cools down
(4) $PH_3 \cdot Cl_2$ is formed with warming up.
Solution:
$PH_3 + 4Cl_2 \rightarrow PCl_5 + 3HCl$
Phosphine gas when mixed with chlorine gas, gives phosphorus pentachloride and HCl.
Hence option (3) is the answer.

12. Which of the following are Lewis acids?
(1) $AlCl_3$ and $SiCl_4$
(2) PH_3 and $SiCl_4$
(3) BCl_3 and $AlCl_3$
(4) PH_3 and BCl_3
Solution:
Lewis acid is an electron pair acceptor.
Both BCl_3 and $AlCl_3$ have vacant p- orbital and thus incomplete octet.
Hence they will act as Lewis acid.
Hence option (3) is the answer.

13. Which of the following statements is wrong?
(1) Single N–N bond is weaker than the single P–P bond
(2) N_2O_4 has two resonance structures
(3) The stability of hydrides increases from NH_3 to BiH_3 in group 15 of the periodic table
(4) Nitrogen cannot form d pi – p pi bond
Solution:
The stability of hydrides decreases from NH_3 to BiH_3 in group 15 of the periodic table.
Hence option (3) is the answer.

14. Glass is a
(1) micro-crystalline solid

(2) super-cooled liquid
(3) gel
(4) polymeric mixture.

Solution:

Glass is a transparent or translucent amorphous supercooled solid solution (supercooled liquid) of silicates and borates.

Hence option (2) is the answer.

15. Boron cannot form which one of the following anions?

(1) $B(OH)_4^-$
(2) BO_2^-
(3) BF_6^{3-}
(4) BH_4^-

Solution:

Because of the non-availability of d-orbitals, boron is unable to expand its octet. Hence the maximum covalence of boron cannot exceed 4.

Hence option (3) is the answer.

16. Which one of the following reactions of Xenon compounds is not feasible?

(1) $2XeF_2 + 2H_2O \rightarrow 2Xe + 4HF + O_2$
(2) $XeF_6 + RbF \rightarrow Rb[XeF_7]$
(3) $XeO_3 + 6HF \rightarrow XeF_6 + 3H_2O$
(4) $3XeF_4 + 6H_2O \rightarrow 2Xe + XeO_3 + 12HF + 1.5O_2$

Solution:

$XeF_6 + 3H_2O \rightarrow XeO_3 + 6HF$

XeF_6 has more tendency to hydrolyse. So the reverse reaction occurs.

Hence option (3) is the answer.

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