

## Previous Year Questions

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|-------------------|-----------|
| <b>Subject</b>    | Chemistry |
| <b>Class</b>      | 11        |
| <b>Topic Name</b> | P Block   |

### 1. Chlorine water on standing loses its colour and forms:-

- (1) HCl and HClO<sub>2</sub>
- (2) HCl only
- (3) HOCl and HOCl<sub>2</sub>
- (4) HCl and HOCl

**Solution:**



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.

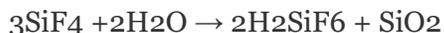
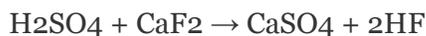
Hence Xe has the highest boiling point in the given elements.

Hence option (2) is the answer.

### 3. The gas evolved on heating CaF<sub>2</sub> and SiO<sub>2</sub> with concentrated H<sub>2</sub>SO<sub>4</sub>, on hydrolysis gives a white gelatinous precipitate. The precipitate is:

- (1) silica gel
- (2) silicic acid
- (3) hydrofluosilicic acid
- (4) calcium fluorosilicate

**Solution:**



Hydrofluosilicic acid is H<sub>2</sub>SiF<sub>6</sub>

Hence option (3) is the answer.

### 4. Which one of the following depletes the ozone layer?

- (1) NO and freons
- (2) SO<sub>2</sub>
- (3) CO
- (4) CO<sub>2</sub>

**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  $sp^3$  and  $sp^2$ , 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.

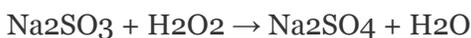
**Solution:**

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:**

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**

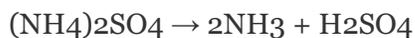
(1)  $(\text{NH}_4)_2\text{Cr}_2\text{O}_7$

(2)  $\text{NH}_4\text{NO}_3$

(3)  $(\text{NH}_4)_2\text{SO}_4$

(4)  $\text{Ba}(\text{N}_3)_2$

**Solution:**



On thermal decomposition of  $(\text{NH}_4)_2\text{SO}_4$ ,  $\text{NH}_3$  is evolved. On thermal decomposition of the other given compounds,  $\text{N}_2$  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)  $\text{PCl}_3$  and  $\text{HCl}$  are formed and the mixture warms up

(3)  $\text{PCl}_5$  and  $\text{HCl}$  are formed and the mixture cools down

(4)  $\text{PH}_3 \cdot \text{Cl}_2$  is formed with warming up.

**Solution:**



Phosphine gas when mixed with chlorine gas, gives phosphorus pentachloride and  $\text{HCl}$ .

**Hence option (3) is the answer.**

**12. Which of the following are Lewis acids?**

(1)  $\text{AlCl}_3$  and  $\text{SiCl}_4$

(2)  $\text{PH}_3$  and  $\text{SiCl}_4$

(3)  $\text{BCl}_3$  and  $\text{AlCl}_3$

(4)  $\text{PH}_3$  and  $\text{BCl}_3$

**Solution:**

Lewis acid is an electron pair acceptor.

Both  $\text{BCl}_3$  and  $\text{AlCl}_3$  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)  $\text{N}_2\text{O}_4$  has two resonance structures

(3) The stability of hydrides increases from  $\text{NH}_3$  to  $\text{BiH}_3$  in group 15 of the periodic table

(4) Nitrogen cannot form d pi – p pi bond

**Solution:**

The stability of hydrides decreases from  $\text{NH}_3$  to  $\text{BiH}_3$  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:**

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

Hence option (3) is the answer.

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